Final Program

PRICM 3

Third Pacific Rim International Conference on Advanced Materials and Processing

Hilton Hawaiian Village Hotel
Honolulu, Hawaii
July 12-16, 1998

PRICM Co-Organizing Sponsoring Societies

Chinese Society for Metals (CSM)
Japan Institute of Metals (JIM)
The Korean Institute of Metals and Materials (KIM)
The Minerals, Metals & Materials Society (TMS)

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Jing Zhu, Tsing Hua University, China

In-country Technical Representatives

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Telephone: 301-227-4995 • Fax: 301-227-5576
Email: denale@oasys.dt.navy.mil

Symposium Registration

Full Conference registration includes admittance to all technical sessions, a copy of the PRICM 3 Proceedings, Welcoming Reception, Symposium Luncheon, and Symposium Reception/Banquet.

Attendees (except students and Hawaii State residents) not staying at the Hilton Hawaiian Village Hotel will be assessed an additional add on fee of $200 to their registration to assist in paying meeting space at the hotel.

Social Functions

Various special social functions have been planned to compliment the formal technical program, including the following:

Sunday Welcoming Reception
18:00pm to 20:00pm - Lagoon Green Area

Monday Luncheon
12 Noon to 13:30pm - Tapa Ballroom II

Thursday Reception/Banquet
18:00pm - 21:00pm - Lagoon Green Area

These functions are included in the registration fee for conference registrants. Tickets for accompanying persons may be purchased at the conference registration desk. Please advise the registration personnel of any special dietary requirements. If you are not able to attend any of these scheduled events, please let the conference registration personnel know to allow for an accurate guarantee.

Accompanying Persons Hospitality

Accompanying persons may enjoy the Conference Hospitality Suite in room #3429 in the Tapa Tower. Refreshments and food items will be available. Accompanying persons registration is required for admission to the Conference Hospitality Suite. Information on local attractions, tour registration, dining, and shopping will also be available.

Classic Destination Management–Hawaii

Classic's PRICM-3
TRAVEL Holtline 1-800-331-7939
09:00AM-16:00PM PST, Monday - Friday

Technical Sessions

The Third Pacific Rim International Conference on Advanced Materials and Processing will commence at 09:00 AM on Monday, July 13, 1998. Sessions by day, paper titles and authors are included in this brochure.

On-site Technical Program Assistance:

Conference Secretariats Dr. Imam and/or Dr. Denale will be present daily at the author's coffee to provide on-site technical assistance. Messages can also be left at the registration desk in the Palace Lounge.

Policy on Audio and Video Recording of Technical Paper Presentation/Sessions

The Minerals, Metals & Materials Society (TMS) reserves the rights to any audio and video reproduction of all presentations at TMS-sponsored meetings. Recording of sessions (audio, video, still photography, etc.) intended for personal use, distribution or copyright without the express written consent of TMS and the individual authors is strictly prohibited. Contact the TMS Technical Program Department to obtain a copy of the waiver release form.

Poster Papers

The poster session is scheduled for set up between 10:00 AM to 14:00 PM, Monday, July 13 and must be removed by 12:00 Noon, Thursday, July 16.

Each author will be provided an 8 ft. long x 4 ft. high poster board for display purposes. Any visual aids that might clarify the results of your own work are encouraged. These can include diagrams, charts, figures, illustrations etc. However, do not post your paper text. Note that graphics should be simple, colorful, well labeled and clear. The title should be written in letters 2 to 5 cm high, and all materials should be readable from a distance of 2 m.

Authors Coffee

Authors and session chairmen are required to attend the Authors Coffee on the day of their presentation. Please refer to the Technical Program for times and days of presentations.

Slide Preview Area

Authors are invited to preview their slides at the Slide Preview Area located in the Tapa Ballroom I during the following hours:

Monday, June 13, 1998	12:00 Noon - 22:00 PM
Tuesday, June 14, 1998	07:00 AM - 17:00 PM
Wednesday, June 15, 1998	07:00 AM - 17:00 PM
Thursday, June 16, 1998	07:00 AM - 12:00 Noon

Publication of the Workshop Papers

Papers accepted for The Third Pacific Rim International Conference on Advanced Materials and Processing are published in the PRICM-3 Conference Proceedings which will be distributed at the meeting.

PRICM-3 Sponsors

The Organizers and attendees of the conference wish to acknowledge their appreciation to the following for their generous financial support of PRICM-3.

National Science Foundation

United States Department of Energy

Naval Surface Warfare Center, Carderock Division

Department of Army, Army Research Office

TableTop Exhibitors

Chinese Society for Metals (CSM)

Japan Institute of Metals (JIM)

The Korean Institute of Metals and Materials (KIM)

The Minerals, Metals & Materials Society (TMS)

Conference Luncheon

Monday, July 13

12:00 Noon

Speaker: James C. Willams
GE Aircraft Engines
Cincinnati, OH 45241
U.S.A.

Topic: **Introducing High Performance Materials: The Non-technical Challenges**

Abstract: High performance systems clearly require high performance materials for their construction. Consequently, there has been and continues to be an emphasis on research efforts aimed at creating new materials concepts and at developing materials processing ideas. At least in the structural materials area, much of this effort has been focused on new materials and process concepts that offer the promise of improved performance. Over time, the range of options available to the materials developer has become more limited due to the natural exhaustion of most of the obvious possibilities. As a result, there are fewer remaining materials and process concepts available to be examined and exploited for introduction into future generation products. Those concepts that are successfully demonstrated to be feasible also will likely be more difficult to reduce to practice and often will require significant capital investment to allow them to be produced or practiced in useful quantities or on a commercial scale. As a result, there is a danger of a widening time lag between proof of concept and actual commercialization of new materials and processes.

This talk will discuss this issue and will attempt to describe some of the barriers that can prevent or delay the product introduction of advanced materials and new processes. Some of these barriers are economic, while others are cultural or philosophical. Where appropriate, the talk will use examples and also will suggest ways to mitigate or minimize these barriers. It may turn out that these non-technical factors will pace the future introduction of new materials and process technology to a greater extent than the rate at which new technical concepts are put forward. Therefore, it is important for the materials research community to recognize this “soft” aspect of the technology introduction process and address it concurrently during research and development activities.

Plenary/Keynote Presentations

Prof. Thomas W. Eager

Prof. Masahiro Koiwa

Prof. Hyung Yong Ra

Quiet Revolution in Material Processing

Professor Thomas W. Eager, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139

In the mid-1980's, the United States, Japan and the European Economic Community declared that the three industries that would drive economic growth into the next century were advanced materials, information technology and biotechnology. Now, more than a decade later, history has proven these predictions to be halfway correct. The next decade will prove whether the remainder of these predictions will come to pass.

Clearly, the information technology industry (computers and telecommunications) can point to many tens of billions of dollars of new businesses over the past 15 years. At the other extreme, the biotechnology industry is still based on promises. Although there is still great excitement about the potential of new biotechnological advances, there simply has not been a very measurable effect on the gross domestic product, unless one wishes to include the tremendous increase in health care costs over the past decade, which represents a negative impact on the economy.

The apparent success of the materials industry lies between information technology and biotechnology. The growth of new materials businesses has been nowhere near the prognostications of ten years ago; however, the properties, durability and economy of traditional materials has improved dramatically over the past two decades.

This is the quiet revolution. It is a quiet revolution because it represents a cost avoidance rather than creation of new materials companies. The average consumer does not perceive the change due to the continuous nature of the improvements, as contrasted with discontinuous changes that are claimed and advertised by the information technology industry.

Progress in Processing Technology for Advanced Materials in China

Professor Shi Likai, General Research Institute of Non-Ferrous Metals, Beijing 100083 China

New processing technology plays an important role in the development of advanced materials. China's Hi-Tech Advanced Materials Research and Development Program always emphasizes the research and development of new processing technologies for advanced materials. Under the support of the program, in the last 10 years the obvious progress has been made in spray forming, directional solidification, superplasticity forming, metallic ion implantation and surface modification, colloidal forming and in-situ solidification of ceramics, high-temperature self-propagation syntheses (SHS), high gravity synthesis of nano-scale particle etc. Some of the mentioned processing technologies have made great contributions to development of advanced materials, some have had practical application in industry. This paper gives brief introduction to China's Hi-Tech Advanced Materials Research and Development Program, and summarizes some of recent progress in processing technology of the program.

Diffusion in Materials - History and Recent Developments

Professor Masahiro Koiwa, Department of Materials Science & Engineering, Kyoto University, Sakyo-Ku, Kyoto, 606-01 Japan

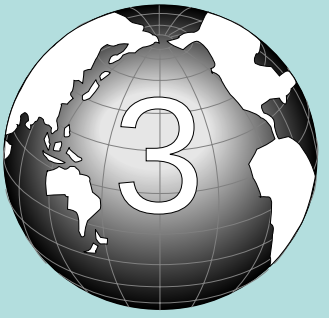
Diffusion is a process that is fundamental in the art and science of materials. The knowledge of diffusion behavior, therefore, is essential for the production of materials or for their use in practical applications. In the first part of this paper, a brief review is given on historical development of the quantitative study of diffusion: the establishment of the diffusion law by A. Fick, the first quantitative measurement of solid state diffusion (Au in Pb) by W. Roberts-Austen, and the demonstration of the self-diffusion in Pb using natural radioactive isotope by G. Hevesy. In the second part, recent investigations on the mechanism of diffusion in intermetallics compounds are reviewed.

The Spray Forming Process and Its Applications

Professor Hyung Yong Ra, Department of Metallurgical Engineering, Seoul National University, San 56-1 Shilim - Dong, Kwanak-ku, Seoul 151-742 Korea

Spray forming, also termed as spray casting or spray deposition, processes generally involve three sequential steps: I) atomization—melt stream is broken into small droplets by gas jet; II) transfer of droplets—the drag force by the high velocity gas jet accelerate the flying speed of the droplets. During the transfer step, droplets are cooled rapidly with a cooling rate of approximately 10^2 ~ 10^6 K/sec, resulting in a very fine spray formed preform microstructure; and III) deposition-droplets of semi-solid state impinge the substrate or surface of preform, which determine the shape and porosity of the preform. Components produced by spray forming offer many advantages, e.g. fine scale microstructure, high efficiency for near-net-shape and metal matrix composite and flexibility for casting of materials which accompany serious segregations in conventional castings. This paper overviews the spray forming research activities carried out world wide, concentrating particularly on the controlling scheme of preform shape, temperature, developments in spray forming device and alloys for commercial applications. Spray forming research activities carried out in Korea will also be reviewed.

PRICM



The Third Pacific Rim International Conference on Advanced Materials and Processing

Technical Program

Daily Listing of Sessions & Papers

Third Pacific Rim International Conference on Advanced Materials and Processing (PRICM 3)
July 12–16, 1998

	Monday, July 13		Tuesday, July 14		Wednesday, July 15		Thursday, July 16	
	AM	PM	AM	PM	AM	PM	AM	PM
Tapa Ballroom I		Poster Presentations opens 7:00pm					Poster Presentations closes 12:00 Noon	
Tapa Ballroom II		Phase Transformations & Their Appls. I 7:00-10:00pm	Phase Transformations & Their Appls. II 8:30-11:50am	Phase Transformations & Their Appls. III 2:00-5:20pm	Phase Transformations & Their Appls. IV 8:30-11:50am	Phase Transformations & Their Appls. V 7:00-10:00pm	Phase Transformations & Their Appls. VI 8:30-11:50am	Phase Transformations & Their Appls. VII 1:30-4:50pm
Tapa Ballroom III	Plenary/Keynote Presentations 9:00am-12:00pm	Intermetallics I 7:00-10:00pm	Intermetallics II 8:30-11:50am	Intermetallics III 2:00-5:20pm	Solid Materials Processing & Mechanical Behavior II 8:30-11:50am	Hydrogen Absorbing Materials I 7:00-10:00pm	Intermetallics IV 8:30-11:50am	
Honolulu Suite I		Magnetic Materials I 7:00-10:00pm	Magnetic Materials II 8:30-11:50am	Magnetic Materials III 2:00-5:20pm	Materials for Microelectronics & Electronic Pack. I 8:30-11:50am	Materials for Microelectronics & Electronic Pack. II 7:00-10:00pm	Materials for Microelectronics & Electronic Pack. III 8:30-11:50am	Non-Destructive Characterization I 1:30-4:50pm
Honolulu Suite II		Composite Materials I 7:00-10:00pm	Composite Materials II 8:30-11:50am	Composite Materials III 2:00-5:20pm	Composite Materials IV 8:30-11:50am	Composite Materials V 7:00-10:00pm		High Transition Temperature Superconductors I 1:30-4:50pm
Honolulu Suite III		Light Metals I 7:00-10:00pm	Light Metals II 8:30-11:50am	Light Metals III 2:00-5:20pm	Light Metals IV 8:30-11:50am	Light Metals V 7:00-10:00pm		
Iolani Suite I		Solid Materials Processing & Mechanical Behavior I 7:00-10:00pm	General Session I 8:30-11:50am	General Session II 2:00-5:20pm	General Session III 8:30-11:50am	General Session IV 7:00-10:00pm	General Session V 8:30-11:50am	General Session VI 1:30-4:50pm
Iolani Suite III		Superplasticity & Superplastic Forming I 7:00-10:00pm	Superplasticity & Superplastic Forming II 8:30-11:50am	Superplasticity & Superplastic Forming III 2:00-5:20pm	Welding & Laser Processing I 8:30-11:50am	Welding & Laser Processing II 7:00-10:00pm	Welding & Laser Processing III 8:30-11:50am	Welding & Laser Processing IV 1:30-4:50pm
Iolani Suite V		Spray Forming I 7:00-10:00pm	Spray Forming II 8:30-11:50am	Spray Forming III 2:00-5:20pm	Melt Processing & Casting I 8:30-11:50am	Smart Materials & Processing I 7:00-10:00pm	Smart Materials & Processing II 8:30-11:50am	Smart Materials & Processing III 1:30-4:50pm
Iolani Suite VI		Rapid Prototyping I 7:00-10:00pm	Rapid Prototyping II 8:30-11:50am	Advanced Ferrous Alloys I 2:00-5:20pm	Advanced Ferrous Alloys II 8:30-11:50am	Advanced Ferrous Alloys III 7:00-10:00pm	Melt Processing & Casting II 8:30-11:50am	Advanced Ferrous Alloys IV 1:30-4:50pm

Third Pacific Rim International Conference on Advanced Materials and Processing - PRICM 3

Hilton Hawaiian Village Hotel -- July 12-16, 1998

PRICM3
Technical Program

MONDAY AM

Plenary/Keynote Presentations
9:00 AM - 12:00 Noon

Monday AM — Room: Tapa Ballroom
July 13, 1998 — Location: Tapa Towers

USA:

QUIET REVOLUTION IN MATERIAL PROCESSING: *Prof. Thomas W. Eager*, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139

China:

PROGRESS IN PROCESSING TECHNOLOGY FOR ADVANCED MATERIALS IN CHINA: *Prof. Likai Shi* , General Research Institute of Non-Ferrous Metals, Beijing 100083

Japan:

DIFFUSION IN MATERIALS - HISTORY AND RECENT DEVELOPMENTS: *Prof. Masahiro Koiwa* , Department of Materials Science and Engineering, Kyoto University, Sakyo-Ku, Kyoto, 606-01

Korea:

THE SPRAY FORMING PROCESS AND ITS APPLICATIONS: *Prof. Hyung Yong RA* , Department of Metallurgical Engineering, Seoul National University, San 56-1 Shilim - dong, Kwanak-ku, Seoul 151-742

MONDAY PM

Composite Materials: Session I

Monday PM — Room: Honolulu Suite II
July 13, 1998 — Location: Tapa Towers

Session Chairs: Prof. K. K. Chawla, University of Alabama at Birmingham, Birmingham, AL 35294-4461, USA; Jingkun Guo, Shanghai Institute of Ceramics, China

7:00 PM INVITED PAPER
PROCESSING AND PROPERTIES OF IN-SITU Al-TiB2 COMPOSITES: *Hank-Jan Brinkman* [1]; [1]Delft University of Technology, Laboratory for Materials Science, Rotterdamseweg 137, Al Delft 2628 The Netherlands

7:20 PM
SYNTHESIS AND SPUTTERING OF COMPOSITE TARGET ANDTHIN FILMS: *A. O. Kunrath* [1]; J. J. Moore[1]; S. Govindarajan[2]; J. Disam[3]; E. A. Levashov[4]; [1]Colorado School of Mines, Advanced Coatings and Surface Engineering Laboratory (ACSEL), Golden, CO USA; [2]White Oak Semiconductor, Richmond, VA USA; [3]Schott Glaswerke, Mainz Germany; [4]Moscow Steel and Alloys Institute, Moscow, Russia

7:40 PM INVITED PAPER
MICROSTRUCTURE AND MECHANICAL PROPERTIES OF REACTION SQUEEZE CAST HYBRID Al MATRIX COMPOSITES: *Changook Son* [1]; Ikmin Park[1]; Kyung-Mox Cho[1]; Ildong Choi[2]; Sunghak Lee[3]; [1]Pusan National University, Dept. of Metallurgical Engineering, Pusan 609-735 Korea; [2]Korea Maritime University, Dept. of Materials Engineering, Pusan 606-791 Korea; [3]Pohang University of Science and Technology, Pohang 790-784 Korea

8:00 PM INVITED PAPER
PROCESSING AND CHARACTERIZATION OF NiAl-Al_2O_3 FUNCTIONALLY GRADIENT COMPOSITES: *Hexiang Zhu* [1]; D. Padmavardani[1]; R. Abbaschian[1]; [1]University of Florida, Dept. of Materials Science & Engineering, Gainesville, FL USA

8:20 PM INVITED PAPER
IN SITU SYNTHESIS AND THERMODYNAMICS OF MOSI2/SiCOMPOSITES: *Luiqi Zhang* [1]; [1]University of Science and Technology, Beijing, China

8:40 PM
VACUUM INVESTMENT CASTING OF CERAMIC PARTICLE REINFORCED ALUMINUM MATRIX COMPOSITE: *Dianbin Wang* [1]; [1]Institute of Aeronautical Materials, China

9:00 PM
DEVELOPMENT OF MMC USING LIQUID METALLURGY TECHNIQUE: CONTROL OF POROSITY AND PARTICULATES DISTRIBUTION: *M. L. Qureshi* [1]; M. Mujahid[1]; [1]GIK Institute of Engineering Sciences & Technology, Topi NWFP 23460 Pakistan

9:20 PM
INTELLIGENT METHODS FOR THE OPTIMIZATION OF COMPOSITE MATERIALS: *Majid Fathi* [1]; Lars Hildebrand[1]; [1]University of Dortmund, Germany

Intermetallics: Session I

Monday PM — Room: Tapa Ballroom III
July 13, 1998 — Location: Tapa Towers

Session Chairs: Jong K. Lee, Michigan Technological University, Dept. of Metallurgical and Materials Engineering, Houghton, MI 49931-1295, USA; Masahara Yamaguchi, Kyoto University, Department of Materials Sciences and Engineering, Kyoto Japan

7:00 PM INVITED PAPER
CYCLIC DEFORMATION BEHAVIOR OF CoTi SINGLE CRYSTALS WITH B2 STRUCTURE: *Ahumad Behgozin* [1]; Takayoshi Nakano[1]; Yukichi Umakoshi[1]; [1]Osaka University, Department of Materials Science and Engineering, Faculty of Engineering, 2-1 Yamadoka, Suita, Osaka 565 Japan

7:20 PM
SMALL FATIGUE CRACK BEHAVIOR IN γ-Base TiAl INTERMETALLICS: *Y. Mutoh* [1]; T. Moriya[1]; S. J. Zhu[1]; Y. Mizuhara[2]; [1]Nagaoka University of Technology, Nagaoka 940-21 Japan; [2]Nippon Steel Corporation, Nakahara-ku, Kawasaki, Japan 211

7:40 PM
HIGH TEMPERATURE STRENGTH PROPERTIES OF Ir DOPED NiAl INTERMETALLIC COMPOUND: *A. Chiba* [1]; T. Ono[1]; X. G. Li[1]; S. Takahashi[1]; [1]Iwate University, Department of Materials Science and Engineering, Morioka 020 Japan

8:00 PM
MECHANICAL PROPERTIES OF Co-BASED ALLOY STRENGTHENED BY $E2_1$-TYPE INTERMETALLIC COMPOUND Co_3AlC: *Kum-Yong Hwang*[1]; Yoshisato Kimura[2]; Seiji Miura[3]; Yoshinao Mishima[1]; [1]Tokyo Institute of Technology, Department of Materials Science and Engineering, Nagatsuta, Midori-ku, Yokohama 226 Japan; [2]University of Pennsylvania, Department of Materials Science and Engineering, 3231 Walnut Street, Philadelphia, PA 19104-6272 USA; [3]Hokkaido University, Division of Materials Science and Engineering, 13N8W, Kita-ku, Sapporo 060 Japan

8:20 PM
EFFECTS OF VOLUME FRACTION OF CONSTITUENT PHASES OF FULLY LAMELLAR TiAl ALLOYS ON CREEP STRENGTH: *Gerhard Wegmann* [1]; Ryuichi Yamamoto[1]; Kouichi Maruyama[1]; [1]Tohoku University, Department of Materials Science, Graduate School of Engineering, Aramaki-Aoba, Aoba-ku, Sendai 980-77 Japan

8:40 PM
MECHANICAL PROPERTIES OF Mo-Al ALLOYS WITH LAMELAR STRUCTURE: *Rikiya Nino*[1]; Seiji Miura[1]; Tetsuo Mohri[1]; [1]Hokkaido University, Division of Materials Science and Engineering, Kita-ku, Sapporo 060-0813 Japan

9:00 PM
EFFECT OF HEATING RATE ON THE COMBUSTION SYNTHESIS OF INTERMETALLICS: *Seung Hurn Lee* [1]; Yong-Seog Kim[1]; Yong-Ho Lee[1]; [1]Hong Ik University, Department of Metallurgy and Materials Science, 72-1 Sangsu Dong, Mapo Ku, Seoul 121-791 Korea

9:20 PM
EFFECT OF MICROSTRUCTURE ON THE CREEP RUPTURE PROPERTIES OF Ti-51at.% Al ALLOY AT HIGH TEMPERATURES: *Isao Mutoh* [1]; Yutaka Kawano[2]; Tatsuo Kumagai[1]; Tatsuhiko Tanabe[1]; Morihiko Nakamura[1]; [1]National Research Institute for Metals, Sengen 1-2, Tsukuba-shi Ibaraki Japan; [2]Mcisci University, Tokyo 191 Japan

Light Metals: Session I

Monday PM — Room: Honolulu Suite III
July 13, 1998 — Location: Tapa Towers

Session Chairs: J. Liu, ALCOA, USA; Shuji Hanada, Tohoku University, Japan

7:00 PM INVITED PAPER
RECENT DEVELOPMENTS IN LIGHT METALS - PART 1: *F. H. Froes* [1]; W. Quist[2]; J. Liu[3]; [1]IMAP, University of Idaho, 321 Mines Bldg., Moscow, ID USA; [2]Boeing Commercial Airplane Co., Deceased; [3]Aluminum Company of America, 100 Technical Drive, Alcoa Center, PA, 15069-0001

7:20 PM
RECENT DEVELOPMENTS IN LIGHT METALS - PART 2

7:40 PM INVITED PAPER
INTERACTION BETWEEN TITANIUM AND ACTIVE PARTICLES OF HYDROGEN PLASMA: *D. V. Sc hur* [1]; V. K. Pishuk[2]; [1]Institute of Hydrogen and Solar Energy of UASNP, Kiev Ukraine; [2]Institute for Problems of Materials Science of NAS, Kiev Ukraine

8:00 PM
EFFECTS OF $L1_2$ $(Al,Cr)_3Ti$ COATINGS ON THE HIGH TEMPERATURE BEHAVIOR OF TiAl ALLOYS: *H. N. Lee* [1]; Z. M. Park[1]; J. Y. Park[1]; M. H. Oh[2]; D. M. Wee[1]; [1]KAIST, Dept. of Matls. Sci & Eng., Taejon 305-701 Korea; [2]KNUT, Dept. of Matls. Sci. & Eng., Kumi 730-701 Korea

8:20 PM
MICROSTRUCTURE CONTROL OF NITROGEN DOPED TiAl ALLOYS: *J. H. Yun* [1]; M. H. Oh[2]; D. M. Wee[1]; [1]KAIST, Dept. of Matls. Sci. & Eng., Taejon 305-701 Korea; [2]KNUT, Dept. of Matls. Sci. & Eng., Kumi 730-701 Korea

8:40 PM
CAST TiAl ALLOYS AS ENGINEERING MATERIALS: *D. X. Zou* [1]; [1]Central Iron & Steel Research Institute, Beijing China

9:00 PM
INTERFACE ENHANCED DEFORMATION TWINNING IN LAMELLAR TiAl/Ti3Al: *L. M. Hsiung* [1]; T. G. Nieh[1]; [1]Lawrence Livermore National Laboratory, P.O. Box 808, L-370, Livermore, CA 94551-9900 USA

9:20 PM
PHASE STABILITY OF Ti-Al ALLOYS CONTAINING 2at.% Cr-4at.% Nb-0.4at.%B: S. K. Kim[1]; *J. K. Park* [1]; [1]Korea Advanced Institute of Science and Technology, Department of Materials Science and Engineering, 373-1 Kusong-Dong, Yusong-Gu, Taejon 305-701 S. Korea

Magnetic Materials: Session I

Monday PM — Room: Honolulu Suite I
July 13, 1998 — Location: Tapa Towers

Session Chairs: J. E. Shield, University of Utah, Department of Materials Science and Engineering, Salt Lake City, UT, USA; Zhenxi Wang, Sub Huan Inc., China

7:00 PM INVITED PAPER
DEVELOPMENT OF NdFeB MAGNET INDUSTRY IN CHINA: *Li Bo* [1]; [1]Central Iron & Steel Research Institute, Beijing,China

7:20 PM INVITED PAPER
DEVELOPMENT AND PROSPECT OF RARE-EARTH PERMANENT MAGNET MATERIALS IN CHINA: *Zhenxi Wang* [1]; [1]Sah Huan Inc., Chinese Academy of Sciences,China

7:40 PM
BRITTLE FRACTURE IN Nd2Fe14B INTERMETALLIC MAGNETS: *Joseph A. Horton* [1]; L. Heatherly[1]; *D. Li*[2]; [1]Oak Ridge National Laboratory, Metals and Ceramics Divison, Oak Ridge, TN 37831-6115 USA; [2]Magnequench International Inc., Anderson, IN 46013 USA

8:00 PM
SPECTROSCOPIC PROPERTIES OF Nd3+ IN FLUOROALUMINATE GLASSES FOR AN EFFICIENT 1.3 OPTICAL AMPLIFIED: Mira Naftaly[1]; *Animesh Jha*[1]; [1]University of Leeds, Department of Materials, Leeds LS2 9JT United Kingdom

8:20 PM
EFFECT OF HYDROGEN ON THE MAGNETIC PROPERTIES OF $(Er_{0.5}Pr_{0.5})_2Fe_{13}Al_4$ AND ITS NITRIDE: *K.G. Suresh* [1]; G. Markandeyulu[1]; S. D. Mahanti[2]; K. V.S. Rama Rao[1]; [1]Indian Institute of Technology, Magnetism and Magnetic Materials Laboratory, Department of Physics, Madras -600 036 India; [2]Michigan State University, Department of Physics and Astronomy, East Lansing, MI 48824 USA

8:40 PM
TEMPERATURE STABILITY OF RARE EARTH PERMANENT MAGNETS: *Xiaojun Yu*[1]; [1]Central Iron & Steel Research Institute, Beijing, China

9:00 PM
DIFFUSION OF INTERSTITIAL ATOMS IN ORDERED MAGNETIC ALLOYS UNDER PRESSURE: *S. Zaginaichenko* [1]; Z. Matysina[2]; D. Schur[1]; [1]Institute for Problems of Materials Science of NAS, Kiev 252680 Ukraine; [2]Dnepropetrovsk State University 320000 Ukraine

9:20 PM
A STUDY ON THE DEFORMATION BEHAVIOR OF NANOCRYSTALLINE Nd-Fe-B MAGNETS: *S. Prakash Narayan* [1]; K. Basu[1]; Y.V.R.K. Prasad[2]; V. Jayaram[2]; [1]Regional Research Laboratory, Bhopal India; [2]Indian Institute of Science, Bangalore India

Phase Transformations and Their Applications: Session I

Monday PM
July 13, 1998

Room: Tapa Ballroom II
Location: Tapa Towers

Session Chairs: K. Inoue, University of Washington, Materials Science and Engineering, Seattle, WA 981950-2120, USA; M. Koiwa, Kyoto University, Japan

7:00 PM INVITED PAPER
ORIGIN OF THE AGING EFFECT AND THE RUBBER-LIKE BEHAVIOR IN MARTENSITE: *K. Otsuka* [1]; X. Ren[1]; [1]University of Tsukuba, Institute of Materials Science, Tsukuba, Ibaraki 305 Japan

7:20 PM
TIME-DEPENDENT NATURE OF MARTENSITIC TRANSFORMATION IN SOME FERROUS AND NON-FERROUS ALLOYS: *Tomo yuki Kakeshita* [1]; Toshio Saburi[2]; Ken'chi Shimizu[2]; [1]Osaka University, Department of Materials Science and Engineering, Faculty of Engineering, Suita, Osaka Japan; [2]Kanazawa Institute of Technology, Department of Materials Science and Engineering, Faculty of Engineering, Nonoichi, Ishikawa Japan

7:40 PM
FORMATION OF REVERSED AUSTENITE FROM $M_{23}C_6$ TYPE CARBIDE IN A HIGH CHROMIUM MARTENSITIC STEEL: *T. Tsuchiyama* [1]; S. Takaki[1]; [1]Kyushu University, Department of Materials Science and Engineering, Faculty of Engineering, Fukuoka 812-81 Japan

8:00 PM
SIMULATION OF MARTENSITIC TRANSFORMATION IN Fe-Ni- ALLOYS: *Tetsuo Suzuki* [1]; Masato Shimono[2]; [1]Foundation for Advancement of International Science, Japan; [2]National Research Institute for Metals

8:20 PM
TWIN INTERFACE STRUCTURES IN MARTENSITICALLY TRANSFORMED Cu-Al-Ni AND Cd ALLOYS: *T. Hara*[1]; T. Ohba[1]; K. Otsuka[2]; [1]Teikyo University, Department of Materials Science and Engineering, Utsunomiya, Tochigi 320 Japan; [2]University of Tsukuba, Institute of Materials Science, Tsukuba, Ibaraki 305 Japan

8:40 PM
QUANTITATIVE EVALUATION OF THE RUBBER EFFECT AND STABILIZATION OF THE MARTENSITIC PHASE IN COPPER ALLOYS: *K. Marukawa*[1]; K. Tsuchiya[2]; [1]Hokkaido University, Dept. of Applied Physics, Sapporo 060 Japan; [2]Toyohashi University of Technology, Dept. of Production Systems Engineering, Toyohashi 441 Japan

9:00 PM
INFLUENCE OF LONG RANGE ORDERING ON MARTENSITIC TRANSFORMATION IN Ag-Zn-Al ALLOYS: *K. Takezawa*[1]; H. Hoshi[1]; K. Marukawa[1]; [1]Hokkaido University, Sapporo 060 Japan

9:20 PM
INTRINSIC THERMODYNAMIC STABILITY AND ITS IMPLICATION TO CHARACTERISTICS OF PHASE EQUILIBRIA IN COHERENT MULTILAYERS: *Joo-Youl Huh* [1]; [1]Korea University, Division of Materials Science and Engineering, 5-1 Anam-Dong, Sungbuk-Ku, Seoul 136-701 Korea

Rapid Prototyping: Session I

Monday PM
July 13, 1998

Room: Iolani Suite VI
Location: Tapa Towers

Session Chairs: Likai Shi, China; Duane Dimos, Sandia National Laboratories, Albuquerque, NM 87185-0367, USA

7:00 PM INVITED PAPER
EXPANDING THE DESIGN SPACE THROUGH INNOVATIVE MATERIALS PROCESSING: *Fritz B. Prinz* [1]; Rodney H. Adams[1]; [1]Stanford University, Mechanical Engineering and Materials Science and Engineering, Stanford, CA USA

7:20 PM
THE PRODUCTION AND PROCESS AUTOMATION FOR PRESINTERING MAGNETIC FERRITE: *Rixin Liu* [1]; [1]National Engineering Research Center for Magnetic Materials, China

7:40 PM
COMPARISON OF EXPERIMENT TO STEFAN SOLUTION FOR PLANAR FLOW SPIN-CASTING: *B. Reed* [1]; X-Q. Zhang[1]; P. H. Steen[1]; [1]Cornell University, School of Chemical Engineering USA

8:00 PM
A KNOWLEDGE BASED SYSTEM FOR RAPID PROTOTYPING OF P/M COMPONENTS: *Lyndon Smith* [1]; [1]University of the West of England, Bristol BS 16 1QY UK

8:20 PM
CALIBRATING FUSED DEPOSITION MODELING RAPID PROTOTYPING SYSTEMS FOR ADAPTIVE BUILD LAYER THICKNESS: *Justin T. Tyberg*[1]; Jan Helge Hohn[1]; [1]Virginia Tech, Department of Mechanical Engineering, Blacksburg, VA 24601-0238 USA

8:40 PM INVITED PAPER
NEAR NET SHAPE PRODUCTION OF METAL COMPONENTS USING LENS: *Eric Schlienger* [1]; Duane Dimos[1]; Michelle Griffith[1]; Joseph Michael[1]; Mike Oliver[1]; Tony Romero[1]; John Smugeresky[2]; [1]Sandia National Laboratories, Albuquerque, NM USA; [2]Sandia National Laboratories, Livermore, CA USA

9:00 PM INVITED PAPER
DIRECT FABRICATION BY SELECTIVE LASER SINTERING: *Joe Beaman* [1]; [1]University of Texas, Mechanical Engineering Department, Austin, TX 78712 USA

9:20 PM
MODELING ASSISTED LASER ENGINEERED NET SHAPING (LENS|) OF FUNCTIONAL MULTI-ELEMENT MATERIALS: *D. M. Keicher* [1]; J A. Smugeresky[2]; J. A. Romero[3]; M. L. Griffith[3]; [1]Optomec Design Company, Albuquerque, NM 87185 USA; [2]Sandia National Laboratories, Livermore, CA; [3]Sandia National Laboratories, Albuquerque, NM

Solid Materials Processing and Mechanical Behavior: Session I

Monday PM Room: Iolani Suite I
July 13, 1998 Location: Tapa Towers

Session Chairs: M. Van De Voorde, P. O. Box 2, 1755 2G Petten, The Netherlands; Kyung-mox Cho, Korea

7:00 PM INVITED PAPER
MICROMECHANICAL INSTABILITIES IN MATERIALS: *James C. M. Li* [1]; [1]University of Rochester, Materials Science Program, College of Arts, Sciences and Engineering, Rochester, NY 14627 USA

7:20 PM
STRENGTHENING AND MECHANICAL STABILITY OF Cu-Ag TWO PHASE ALLOY: *Moon Soo Lim* [1]; Jae Sook Song[1]; Sun Ig Hong[1]; [1]Chungnam National University, Department of Metallurgical Engineering, Taedock Science Town, Taejon 305-764 Korea

7:40 PM
PROPERTIES OF FUNCTIONALLY GRADED NiCrAlY/ZrO_2 THERMAL BARRIER COATING LAYERS FABRICATED BY PLASMA SPRAYING: *Cha-hw an Park*[1]; Kyung-mox Cho[1]; Ik-min Park[1]; Myung-gyue Jung[2]; [1]Pusan National University, Dept. of Metall. Eng, Pusan 609-735 Korea; [2]Samsung Aerospace Industries Co., Sungsu dong, Changwon 641-120 Korea

8:00 PM
DEVELOPMENT OF P/M Nb-BASE RECORROSIVE MATERIAL: *Tewei Huang* [1]; [1]Central Iron and Steel Research Institute, Beijing, China

8:20 PM
EFFECTS OF APPLIED STRESS AND OTHER FACTORS ON THE BAINITIC TRANSFORMATION IN Cu-Zn-Al ALLOYS: *M. Tabuchi*[1]; M. Takahashi[2]; [1]Japan Atomic Energy Research Institute, Dept. of Materials Science and Engineering, Tokai-muri, Ibaraki-ken 319-11 Japan; [2]Hokkaido University, Dept. of Applied Physics, Sapporo 060 Japan

8:40 PM
PRODUCTION OF ULTRA-FINE Fe-Cu PARTICLES BY DC PLASMA JET METHOD AND THEIR CHARACTERIZATION: *K. Tsuchiya* [1]; Y. Todaka[1]; T. Ishida[1]; M. Umemoto[1]; [1]Toyohashi University of Technology, Dept. of Production Systems Engineering, Aichi 441 Japan

9:00 PM
TRIBIOLOGICAL BEHAVIOR OF P/M SELF-LUBRICATING POROUS BRONZE BEARINGS: *M. Zamani Mehr*[1]; H. Alimohammadi[2]; M. Masnavi[1]; [1]I.A.U. Tehran, Plasma Physics Research Center, Tehran Iran; [2]Aria Diesel Part Industries, Research and Development, Tehran Iran

9:20 PM
THE STRAIN PATH DEPENDENCE OF MICROSTRUCTURE DEVELOPED IN OFHC Cu BY ECA PRESSING: *W. H. Huang* [1]; M. F. Li[1]; P. W. Kao[1]; C. P. Chang[1]; [1]National Sun Yat-Sen University, Institute of Materials Science and Engineering, Kaohsiung, Taiwan ROC

Spray Forming: Session I

Monday PM Room: Iolani Suite V
July 13, 1998 Location: Tapa Towers

Session Chairs: Ivan Caplan, Naval Surface Warfare Center, Carderock Division, West Bethesda, MD 20817-5700, USA; Jingguo Zhang, Shanghai Iron & Steel Research Institute, Shanghai, China

7:00 PM INVITED PAPER
A REVIEW OF THE SPRAY FORMING OF HIGH PERFORMANCE ALUMINIUM ALLOYS - PART 1: *Alan Leatham* [1]; Andrew Ogilvy[1]; [1]Osprey Metals, Ltd., Dept. of Research, Red Jacket Works, Millands Rd., Wales UK

7:20 PM
A REVIEW OF THE SPRAY FORMING OF HIGH PERFORMANCE ALUMINUM ALLOYS - PART 2

7:40 PM
MECHANICAL PROPERTIES OF SPRAY FORMED Al-Fe-V-Si ALLOYS: *M. F. Amateau* [1]; T. J. Eden[1]; [1]The Pennsylvania State University, University Park, PA 16802 USA

8:00 PM
MECHANICAL AND MICROSTRUCTURAL EVALUATION OF SPRAY FORMED ALUMINUM ALLOY: *S. R. Horn* [1]; J. L. Rossi[1]; [1]Instituto de Pesquisas Energeticas e Nucleares - IPEN, Powder Processing Centre - CPP, P.O. Box 11.049, Sae Paulo Brazil

8:20 PM
PROPERTIES AND MICROSTRUCTURE OF Cu-15Ni-8Sn ALLOY PREPARED BY SPRAY FORMING: *Jing guo Zhang* [1]; [1]Shanghai Iron & Steel Research Institute, Shan,ghai China

8:40 PM
PROPERTIES OF SPRAYFORMED TOOL AND HIGH SPEED STEELS: *Claus Speig elhauer* [1]; [1]Danish Steel Works Ltd, Frederiksvrerk 3300 Denmark

9:00 PM
TITANIUM SPRAY FORMED ALLOYS: *Craig Madden* [1]; Rich Rebis[1]; Leslie Kohler[1]; [1]US Navy, Naval Surface Warfare Center, Carderock Division, Bethesda, MD 20817-5700 USA

Superplasticity and Superplastic Forming: Session I

Monday PM Room: Iolani Suite III
July 13, 1998 Location: Tapa Towers

Session Chairs: A. K. Mukherjee, University of California, Department of Chem. Eng. & Mats., Davis, CA, USA;
T. Sakuma, The University of Tokyo, Japan

7:00 PM INVITED PAPER
THE ROLE OF DEFORMATION MECHANISMS IN THE SOLID STATE JOINT FORMATION DURING SUPERPLASTIC FLOW: *O. A. Kaibyshev* [1]; V. V. Astanin[1]; R. Ya. Lutfullin[1]; [1]Russian Academy of Sciences, Institute for Metals Superplasticity Problems, Khalturina 39, Ufa 450001 Russia

7:20 PM INVITED PAPER
ON THE MECHANISMS OF HIGH STRAIN RATE SUPERPLASTICITY IN METAL MATRIX COMPOSITES: *Yong Li* [1]; Terence G. Langdon[1]; [1]University of Southern California, Departments of Materials Science and Mechanical Engineering, Los Angeles, CA 90089-1453 USA

7:40 PM
CONTRIBUTION OF GRAIN BOUNDARY SLIDING IN SUPERPLASTIC 7475 ALLOYS PROCESSED BY POWDER METALLURGY AND INGOT METALLURGY: *Toshiji Mukai* [1]; Tomotake Hirata[2]; Shigenori Tanabe[2]; Masahide Kohzu[2]; Kenji Higashi[2]; [1]Osaka Municipal Technical Research Institute, Mechanical Engineering Department, Joto-ku, Osaka 536 Japan; [2]Osaka Prefecture University, Department of Metallurgy and Materials Science, Gakuen-cho, Sakai 593 Japan

8:00 PM INVITED PAPER
GRAIN BOUNDARY STRUCTURE AND CHEMICAL BONDING STATE OF SiO_2- DOPED TZP WITH A SMALL AMOUNT OF METAL OXIDES: *Yuichi Ikuhara* [1]; Isao Tanaka[2]; Parjaree Thavorniti[1]; Taketo Sakuma[1]; [1]The University of Tokyo, Department of Materials Science, Faculty of Engineering, 7-3-1 Gibgi, Bunkyo-ku, Tokyo 113 Japan; [2]Kyoto University, Department of Materials Science and Engineering, Sakyo-ku, Kyoto 606-01 Japan

8:20 PM
OBSERVATION OF LOW TEMPERATURE SUPERPLASTICITY OF ZK60 MAGNESIUM ALLOY: *H. Watanabe* [1]; T. Mukai[1]; K. Higashi[2]; [1]Osaka Municipal Technical Research Institute, Morinomiya Joto-ku, Osaka 536 Japan; [2]Osaka Prefecture University, College of Engineering, Sakai, Osaka 593 Japan

8:40 PM INVITED PAPER
THE MICROTWINNING OF MARTENSITE VARIANTS AND LINEAR SUPERELASTICITY IN A COLD DRAWN TiNi ALLOY: *Liancheng Zhao* [1]; [1]Harbin Institute of Technology, China

9:00 PM
A MODEL OF SUPERPLASTIC DEFORMATION: *O. A. Kaibyshev* [1]; V. V. Astanin[1]; A. I. Pshenichniuk[1]; [1]Russian Academy of Sciences, Institute for Metals Superplasticity Problems, Khalturina 39, Ufa 450001 Russia

9:20 PM
THE INFLUENCE OF Al_2TiO_5 ADDITION INTO Al_2O_3-ZrO_2 BINARY CERAMICS ON SUPERPLASTIC DEFORMATION: *Muneo Oka* [1]; Hideki Yamada[1]; [1]Tottori University, Department of Mechanical Engineering, Tottori 680 Japan

TUESDAY AM

Composite Materials: Session II

Tuesday AM Room: Honolulu Suite II
July 14, 1998 Location: Tapa Towers

Session Chairs: J. J. Moore, ACSEL, Golden, CO, USA;
Y. Mishima, Japan

8:30 AM INVITED PAPER
THERMAL FATIGUE IN FIBER REINFORCED METAL MATRIX COMPOSITES : *K. K. Chawla* [1]; [1]University of Alabama at Birmingham, Birmingham, AL USA

8:50 AM INVITED PAPER
COMBINES MECHANICAL ALLOYING AND CONTROLLED COMBUSTION SYNTHESIS IN THE PRODUCTION OF Ti-TiB MMC'S: *S. Ozbilen* [1]; [1]Gazi University, Fac. of Tech. Education, Metallurgical Education Dept., Ankara Turkey

9:10 AM
FABRICATION OF TiS/TiAl-SiC GRADIENT COATINGS ON GAMME Ti ALUMINIDES AND OXIDATION BEHAVIOR: *Shangkai Gong* [1]; [1]Beijing University of Aeronautics and Astronautics, Beijing China

9:30 AM
SYNTHESIS, MICROSTRUCTURE AND PROPERTIES OF TITANIUM ALLOY-BASED PARTICULATE COMPOSITES: *Masuo Hagiwara* [1]; [1]National Research Institute for Metals, 1-2-1 Sengen, Tsububa, Ibaraki 305 Japan

9:50 AM
SINTERING OF PARTICULATE REINFORCED TITANIUM MATRIX COMPOSITES: *David E. Alman* [1]; [1]Albany Research Center, U.S. Department of Energy, Albany, OR 97321 USA

10:10 AM
COMPARISON OF IN SITU FIBRE AND INTERFACE PROPERTIES BETWEEN SEALED AND UNSEALED 3-D WOVEN SiC/SiC-BASED COMPOSITE AFTER TENSILE TESTING UP TO 1380°C IN AIR AND VACUUM: *I. J. Davies* [1]; T. Ishikawa[1]; M. Shibuya[1]; T. Hirokawa[1]; J. Gotoh[1]; [1]National Aerospace Laboratory Japan

10:30 AM
STRENGTH AND MICROSTRUCTURE OF Al/Al_2O_3 COMPOSITES FABRICATED BY REACTION BETWEEN SiO_2 AND MOLTEN Al: *Noboru Yoshikawa* [1]; Yoshiyuki Watanabe[2]; Zully M. Vollza[3]; Shoji Taniguchi[1]; Artsushi Kikuchi[1]; [1]Tohoku University, School of Metallurgy, Division of Engineering, Graduate Schools, Aza-Aoba, Aramaki, Aoba-ku, Sendai, Miyagi 980-77 Japan; [2]Down Mining Co., Ltd.; [3]Ingeominas, Diagonal 53, Santafe De Botota, D.C. Columbia

10:50 AM
ANALYSIS OF RECLAMATION MECHANISM OF DISCONTINUOUSLY REINFORCED ALUMINUM MATRIX COMPOSITES: *Zhongliang Shi* [1]; [1]Shanghai Jiao Tong University, China

11:10 AM
PREPARATION OF Ti-TiC MICROLAMINATES BY EB-PVD AND THEIR MECHANICAL PROPERTIES: *Xiaofang Bi* [1]; [1]Beijing University of Aeronautics and Astronautics, Beijing, China

General Abstracts: Session I

Tuesday AM
July 14, 1998

Room: Iolani Suite I
Location: Tapa Towers

Session Chairs: P. Tardy, Hungarian Mining & Metall. Society, Budapest, Hungary; O. S. Es-Said, Loyola Marymount University, Mechanical Engineering Department, Los Angeles, CA 90045, USA

8:30 AM INVITED PAPER
SYNTHESIS AND PROPERTIES OF BULK AMORPHOUS ALLOYS IN FERROUS AND NONFERROUS ALLOY SYSTEMS: *Akilusa* [1]; Tao Zhang[1]; Aldra Takeuchi[1]; Akibiro Makino[1]; [1]Tohoku University, Institute for Materials Research, Katahira 2-1-1, Aoba-ku, Sendai Japan

8:50 AM
VECTORIAL PHOTOINDUCED EFFECTS IN AMORPHOUS (Se, S)-BASED THIN FILM: *Hyun-Y ong Lee* [1]; Soo-Ho Park[1]; Hong-Bay Chung[1]; [1]Kwangwoon University, Dept. of Electronic Materials Engineering, Seoul 139-701 Korea

9:10 AM
CREEP BEHAVIOR OF ALUMINUM THIN FILM AT ELEVATED TEMPERATURE: *Tomotaka Yamashita* [1]; Goroh Itoh[1]; Takanori Nitta[1]; [1]Nagaoka University of Technology, Kami-Tomioka, Nagaoka, Niigata-pref 940-21 Japan

9:30 AM
SPUTTER-DEPOSITED AMORPHOUS Ti-Ni FILMS: *A. Gyobu* [1]; T. Saburi[1]; H. Horikawa[2]; [1]Niihama National College of Technology, Department of Mechanical Engineering, 7-1 Yakumo-cho, Niihama, Ehime 792 Japan; [2]Hurukawa Techno Material Co., Ltd, NT-Alloy Production and Development Section, Special Metals Division, 518 Higashi-yahata, Hiratsuka, Kanagawa 254 Japan

9:50 AM INVITED PAPER
ADVANCES IN MATERIALS SCIENCE IN CENTRAL EUROPE FROM THE 18TH CENTURY ON : *P. Tardy* [1]; S. W. Lee[1]; [1]Hungarian Mining and Metallurgical Society, Budapest Hungary

10:10 AM
THE EFFECT OF ELECTRON EMISSION ON THE ROUGHNESS OF SILICON FILMS IN HF-CVD: *W. S. Cheong* [1]; N. M. Hwang[1]; D. Y. Yoon[1]; [1]KAIST

10:30 AM
GUINIER-PRESTON ZONES IN SPUTTER-DEPOSITED Ti-Ni THIN FILMS: *Y. Nakata* [1]; T. Tadaki[2]; H. Sakamoto[3]; A. Tanaka[4]; K. Shimizu[5]; [1]The Institute of Scientific Research, 8-1 Mihoga-oka, Ibaraki, Osaka 567 Japan; [2]Osaka Women's University, Dept. Natural Science, Sakai, Osaka 590 Japan; [3]Teikyo University, School of Science & Eng., Utsunomiya, Tochigi 320 Japan; [4]Showa Electric Wire & Cable Co., Ltd., 2-1-1 Odasakae, Kawasaki-ku, Kawasaki, Kanagawa 210 Japan; [5]Kanazawa Institute of Technology, 7-1 Ohgigaoka, Nonoichi, Kana University of Science and Technology, Beijing Chinazawa-South, Ishikawa 921 Japan

10:50 AM
RECRYSTALLIZATION TEXTURES OF SILVER ELECTRODEPOSITS: *Hyo-Seung Nam* [1]; Don Nyung Lee[1]; [1]Seoul National University, Division of Materials Science and Engineering, Seoul 151-742 Korea

Intermetallics: Session II

Tuesday AM
July 14, 1998

Room: Tapa Ballroom III
Location: Tapa Towers

Session Chairs: J. J. Lee, Inha University, Seoul, Korea; Yukichi Umakoshi, Osaka University, Department of Materials Science and Engineering, Faculty of Engineering, 2-1 Yamad-oka, Suita, Osaka 565 Japan

8:30 AM INVITED PAPER
CURRENT TOPICS IN THE RESEARCH AND DEVELOPMENT OF TiAl-BASE ALLOYS AND HIGH TEMPERATURE SILICIDES: *Masahar a Yama guc hi*[1]; [1]Kyoto University, Department of Materials Sciences and Engineering, Kyoto Japan

8:50 AM
MECHANICAL BEHAVIOR OF Fe_3Al BASED INTERMETALLIC ALLOYS AT HIGH TEMPERATURES: *Paulo Iris F erreira*[1]; Itamar Ferreira[2]; Antonio Augusto Couto[1]; [1]Instituto de Pesquisas Energéticas e Nucleares, R. Henrique Botticini, 21, Sao Paulos-SP 05587-020 Brazil; [2]Engenharia Mecanica-UNICAMP, Departamento de Materiais, Campinas, SP Brazil

9:10 AM INVITED PAPER
CREEP DEFORMATION CHARACTERISTICS OF THE LAMELLAR TiAl ALLOYS RELATED WIT MICROSTRUCTURE: *S. W. Nam* [1]; H. S. Cho[1]; [1]Korea Advanced Institute of Science and Technology

9:30 AM
HIGH TEMPERATURE CREEP DEFORMATION OF UNIDIRECTIONALLY SOLIDIFIED Ti-48 At% Al ALLOY: *Si Y. Chang* [1]; [1]Tokyo Institute of Technology

9:50 AM
PROCESSING AND MECHANICAL PROPERTIES OF DIRECTIONALLY SOLIFIED TiAl-Mo ALLOYS: *K. Chihar a*[1]; David R. Johnson[1]; H. Inui[1]; M. Yamaguchi[1]; [1]Kyoto University, Department of Materials Science and Engineering, Kyoto 606-01 Japan

10:10 AM
HIGH TEMPERATURE STRENGTHENING MECHANISM OF TiAl AND Nb, Al BASE INTERMETALLICS: *K. Hashimoto* [1]; [1]Nippon Steel Corp

10:30 AM
EFFECTS OF Al_5Ti_3 PRECIPITATES ON THE FLOW STRESS REVERSIBILITY IN SINGLE CRYSTAL OF TiAl (Ti-56 at% Al): *K. Chikugo* [1]; [1]Kyoto University

10:50 AM
EFFECTS OF TERNARY ALLOYING ELEMENTS ON PLASTIC DEFORMATION OF $MoSi_2$ SINGLE CRYSTALS: *K. Ishikaw a*[1]; H. Inui[1]; M. Yamaguchi[1]; [1]Kyoto University, Department of Mater. Sci. Eng., Kyoto 606-01 Japan

Light Metals: Session II

Tuesday AM Room: Honolulu Suite III
July 14, 1998 Location: Tapa Towers

Session Chairs: F. H. Froes, University of Idaho, Institute for Materials and Advanced Processes, Moscow, ID 83844-3026, USA; Dongwha Kum, Korea Institute of Science and Technology, Division of Metals, P.O. Box 131, Cheongryang, Seoul 130-650 Korea

8:30 AM
MAGNESIUM SCIENCE, TECHNOLOGY AND APPLICATIONS - PART 1: *Eliezer* [1]; [1]University of the Nagev, P.O. Box 653, Beer Sheva 84105 Israel

8:50 AM
MAGNESIUM SCIENCE, TECHNOLOGY AND APPLICATIONS - PART 2

9:10 AM
ON THE MORPHOLOGY AND CHARACTERISTICS OF Mn-BEARING DISPERSOIDS IN AlMgSi ALLOYS: *I. G. Moon* [1]; A. D. Shan[2]; J. E. Yoo[3]; H. S. Kim[1]; J. Y. Chang[1]; H. S. Ko[1]; J. W. Park[1]; [1]Korea Institute of Science and Technology, Division of Metals, P.O. Box 131, Cheongryang, Seoul 130-650 Korea; [2]Shanghai Jiao Tong University, Department of Materials Science China; [3]Iljin Corporation, Metals Lab, Dowha, Mapo, Seoul 121-040 Korea

9:30 AM
STRUCTURE-PROPERTY RELATIONSHIPS IN ADVANCED TITANIUM ALLOYS: *O. Ivashishin*[1]; O. N. Senkov[1]; F. H. Froes[1]; P. A. Allen[1]; [1]Academy of Science, Kilev Ukrain

9:50 AM
MICROSTRUCTURE AND PROPERTIES OF A NEW SUPER-HIGH STRENGTH Al-Zn-Mg-Cu ALLOY C912: *Y. L. Wu*[1]; [1]Institute of Aeronautical Materials China

10:10 AM
EFFECT OF HIP ON THE MICROSTRUCTURE AND MECHANICAL PROPERTIES OF THE CAST A-356 ALUMINUM: *Charles S.C. Lei* [1]; William E. Frazier[1]; E. W. Lee[1]; [1]NAWCAD, Patuxent River, MD USA

10:30 AM
MODELLING AS A BASIS FOR MICROSTRUCTURAL DESIGN IN HIGH STRENGTH Al AND Mg ALLOYS: *J. F. Nie* [1]; B. C. Muddle[1]; [1]Monash University, Department of Materials Engineering, Clayton, Victoria 3168 Australia

10:50 AM
THE EFFECT OF 45Υ ROLLING MODE ON THE MECHANICAL PROPERTIES OF ANISOTROPIC METALS: *O. S. Es-Said* [1]; [1]Loyola Marymount University, Mechanical Engineering Department, Los Angeles, CA 90045 USA

11:10 AM
MICROSTRUCTURE AND CREEP BEHAVIOR OF Al-Cu-Mg AND Al-Cu-Mg ALLOYS: *Ning Wang* [1]; Edgar A. Starke[1]; [1]University of Virginia, Materials Science and Engineering, Thornton Hall B210, Charlottesville, VA 22903 USA

Magnetic Materials: Session II

Tuesday AM Room: Honolulu Suite I
July 14, 1998 Location: Tapa Towers

Session Chairs: J. A. Horton, Oak Ridge National Lab., Metals and Ceramics Division Bldg., Oak Ridge, TN 37831-6115, USA; H. Fujimori, Tohoku University, Japan

8:30 AM INVITED PAPER
ELECTRON MICROSCOPIC STUDY ON MICROSTRUCTURE OF MAGNETIC MULTILAYERS RELATED TO THE SPIN-DEPENDENT SCATTERING: *Z. Zhang* [1]; [1]Chinese Academy of Sciences, China

8:50 AM
ANISOTROPIC MAGNETIC PROPERTIES OF NANOCRYSTALLINE BULK Fe_{66} Co_{20} Nd_2 Pr_7 B_5 MAGNETS PRODUCED BY CRYSTALLIZING UNDER UNIAXIAL PRESSURE: *A. Kojima* [1]; [1]Alps Electric Co., Ltd.

9:10 AM
SOLIDIFICATION MODELING IN RAPIDLY SOLIDIFIED RARE EARTH PERMANENT MAGNETS: *J. E. Shield* [1]; M. J. Kramer[2]; C. P. Li[2]; R. W. McCallum[2]; D. J. Branagan[3]; [1]University of Utah, Department of Materials Science and Engineering, Salt Lake City, UT 84112 USA; [2]Ames Laboratory, USDOE; [3]Idaho National Engineering and Environmental Laboratory, Idaho Falls, ID

9:30 AM
ELECTROMAGNETIC WAVE ADSORPTION PROPERTIES AND MICROSTRUCTURE OF $BaFe_{12-x}(TiMn)_xO_{19}$: *Katsumi Okayama* [1]; Hiroyasu Okayama[2]; Toshio Kagotani[1]; Hajime Nakamura[1]; Satoshi Sugimoto[1]; Yoshiuyuki Yoshida[1]; Motofumi Homma[1]; [1]Tohoku University, Department of Materials Science, Graduate School of Engineering, Sendai 980-77 Japan; [2]Electromagnetic Compatibility Research Laboratories Co.,Ltd., Sendai 980-77 Japan

9:50 AM
SYNTHESIS AND MAGNETIC PROPERTIES OF FERROXPLANNA TYPE Co_2-Y FERRITE $(Ba_{1-x}Sr_x)_2Co_2Fe_{12}O_{22}$(x=0.0-1.0): *Toshio Kagotani* [1]; Takaaki Suzuki[1]; Hajime Nakamura[1]; David Book[1]; Satoshi Sugimoto[1]; Masuo Okada[1]; Motofumi Homma[1]; [1]Tohoku University, Department of Materials Science, Graduate School of Engineering, Sendai 980-77 Japan

10:10 AM
MICROSTRUCTURE AND PROPERTIES OF Co-C FILMS PREPARED BY A DUAL SOURCE DEPOSITION SYSTEM: *M. Azumi* [1]; J. Shi[1]; Y. Haga[1]; N. Nittono[1]; [1]Tokyo Institute of Technology, Department of Metallurgical Engineering, 2-12-1 Oh-okayama, Meguro-ku, Tokyo 153 Japan

10:30 AM
FABRICATION AND CHARACTERIZATION OF Al-Co/Al-N-Co MULTILAYER FILMS: *A. G. Roy*[1]; O. Nittono[1]; [1]Tokyo Institute of Technology, Department of Metallurgical Engineering, 2-12-1 Oh-okayama, Meguro-ku, Tokyo 152 Japan

10:50 AM
OPTICAL PROPERTIES OF BISMUTH AND GALLIUM SUBSTITUTED THULIUM IRON GARNET FILMS SUITABLE FOR OPTICAL DEVICES: *P. Mukhopadhyay* [1]; S. Orpe[1]; V. Chandravanshi[1]; [1]Advanced Centre For Research in Electronics, I.I.T., Powai 40076 Bombay

11:10 AM
CARBONATION OF Re_2Fe_{17} (RE-RARE EARTH) COMPOUNDS BY ARC MELTING TECHNIQUE: *M. Venkatesan* [1]; U. V. Varadaraju[1]; K. V.S. Rama Rao[1]; [1]Indian Institute of Technology, Magnetism and Magnetic Materials Laboratory, Department of Physics, Madras 600 036 India

Phase Transformations and Their Applications: Session II

Tuesday AM Room: Tapa Ballroom II
July 14, 1998 Location: Tapa Towers

Session Chairs: B. B. Rath, Naval Research Laboratory, Washington, DC 20375-5340,USA; Tetsuo Mohri, Hokkaido University, Division of Materials Science and Engineering, Kita-ku, Sapporo 060-0813 Japan

8:30 AM INVITED PAPER
COMPUTATIONAL INVESTIGATIONS ON THE MICROSTRUCTURE FORMATION IN METALLIC MATERIALS BASED UPON THE PHASE FIELD METHOD: *Toru Miyazaki* [1]; [1]Nagoya Institute of Technology, Department of Materials, Nagoya 466 Japan

8:50 AM INVITED PAPER
THERMODYNAMIC AND KINETICS ASPECTS OF THE SYNTHESIS OF TITANIUM NITRIDE AND CARBONITRIDES FROM TiO_2 AND CARBON IN NITROGEN ATMOSPHERES: *Animesh Jha* [1]; S. J. Yoon[2]; [1]University of Leeds, Clarendon Road, Leeds LS2 9JT UK; [2]Miryang University, Department of Materials Science, Miryang S. Korea

9:10 AM
DIFFUSE PHASE TRANSITION IN $Pb(Fe_{0.5}Nb_{0.5})O_3$ FERROELECTRIC CERAMICS: *Katsur o Oda* [1]; [1]University of Tokyo, Institute of Industrial Science, 7-3-1 Roppongi Minato-ku, Tokyo 106 Japan

9:30 AM
EFFECTIVE PAIR INTERACTION ENERGIES IN FCC RANDOM ALLOYS BY DIRECT CONFIGURATIONAL AVERAGING AND PHASE DIAGRAMS OF BINARY ALLOYS: *T. Hoslino* [1]; M. Asato[1]; K. Masuda-Jindo[2]; [1]Shizuoka University, Department of Material Science and Engineering, Hamamatsu 432 Japan; [2]Tokyo Institute of Technology, Department of Material Science and Engineering, Yokohama 227 Japan

9:50 AM
GROWTH BEHAVIOR OF Ti_3Al DIFFUSION COUPLES: *K. Fujiwara*[1]; Z. Horita[1]; M. Nemoto[1]; [1]Kyushu University, Dept. Materials Science and Engineering, Fukuoka 812-81 Japan

10:10 AM
DIFFUSION OF CONSTITUENT ELEMENTS IN Ni_3Ge STUDIED BY TRACER AND INTERDIFFUSION EXPERIMENTS: *H. Nakajima* [1]; T. Ikeda[2]; K. Nanaka[3]; W. Sprengel[1]; H. Numakura[2]; W. Sprengel[2]; [1]Osaka University, The Institute of Scientific and Industrial Research, Ibaraki, Osaka 567 Japan; [2]Kyoto University, Department of Materials Science and Engineering, Kyoto, Japan 606; [3]Iwate University, Department of Materials Science and Technology, Morioka 020 Japan

10:30 AM
FORMATION OF THE EXTRAORDINARY LAMELLAR STRUCTURE DUE TO THE DECOMPOSITION OF HIGH-TEMPERATURE α PHASE IN φ-TiAl BASED ALLOYS : *M. Take yama* [1]; Y. Ohmura[1]; H. Horikoshi[1]; T. Matsuo[1]; [1]Tokyo Institute of Technology, Department of Metallurgical Engineering, 2-12-1 Ookayama, Meguro-ku, Tokyo 152 Japan

10:50 AM
PREPARATION OF Sb-DOPED SnO_2 ULTRAFINE PARTICLES FROM Sol-Gel METHOD: *Yi Hu*[1]; S. -H.-T. Hou[1]; [1]Tatung Institute of Technology, Department of Materials Engineering, Taipei, Taiwan ROC

11:10 AM
HIGH-ENERGY ELECTRON IRRADIATION INDUCED PHASE TRANSFORMATION IN Fe-Ni BINARY AND TERNARY ALLOYS: *Yoshinori Mur ata* [1]; Masahiko Morinaga[1]; Kyohei Takami[1]; Hirotaro Mori[2]; [1]Nagoya University, Dept. of Materials Science and Engineering, Graduate School of Engineering, Furo-cho, Chikusa-ku, Nagoya 464-01 Japan; [2]Osaka University, Research Centre for Ultra-High Voltage Electron Microscopy, Yamadaoka, Suita, Osaka 565 Japan

Rapid Prototyping: Session II

Tuesday AM Room: Iolani Suite VI
July 14, 1998 Location: Tapa Towers

Session Chairs: L. Smith, University of West of England, Cold Harbour Lane, Bristol 1QY UK; F. Prinz, Stanford University, USA

8:30 AM INVITED PAPER
SOLID FREEFORM FABRICATION (SFF) OF ADVANCED FUNCTIONAL CERAMIC COMPONENTS: *Stephen C. Danforth* [1]; Ahmad Safari[1]; [1]Rutgers University, Department of Ceramic & Materials Science & Engineering, Piscataway, NJ 08855-0909 USA

8:50 AM INVITED PAPER
NEW PROCESS AND MATERIALS DEVELOPMENTS IN 3-DIMENSIONAL PRINTING: *M. Cima* ; J. Moon; J. Grace

9:10 AM
FAST FREEFORM FABRICATION OF METAL PARTS USING PLANAR LAYER DEPOSITION TECHNIQUE: *Amper e A. Tseng* [1]; [1]Arizona State University, Manufacturing Institute, P.O. Box 875106, Tempe, AZ 85287-5106 USA

9:30 AM
METAL PART PROCESSING BY SLS/HIP: *Joseph Wright* [1]; Ronald Knight[1]; [1]Lockheed Martin Vought Systems

9:50 AM
LAYERED MANUFACTURING OF REINFORCED COMPOSITES: *G. Zak* [1]; M. N. Sela[1]; C. B. Pack[1]; B. Benhabib[1]; [1]University of Toronto, Department of Mechanical and Industrial Engineering, 5 King's College Road, Toronto, Ontario M58 3G8 Canada

10:10 AM
THE METAL PRINTING PROCESS - SOLID FREEFORM FABRICATION OF OBJECTS IN METAL AND CERAMICS: *Nils Aksel Ruud* [1]; [1]SINTEF, Technology Management, Rich. Birkelandsv. 2B, Trondheim N-7034 Norway

10:30 AM
DIRECT FABRICATION OF CERAMICS AND COMPOSITES FROM SLURRIES: ROBOCASTING TECHNOLOGY: *Joseph Cesarano* [1]; Bruce H. King[1]; Paul Calvert[2]; [1]Sandia National Laboratories, Albuquerque, NM USA; [2]University of Arizona, Tucson, AZ

10:50 AM
MATERIALS AND PROPERTIES OF COMPONENTS FORMED USING THE 3DWIRE PROCESS: *Michelle Griffith* [1]; L. D. Harwell[1]; D. L. Greene[1]; J. A. Romero[1]; T. Buchheit[1]; T. Crenshaw[1]; V. Tikare[1];

[1]Sandia National Laboratories, P.O. Box 5800, MS 0958, Albuquerque, NM 87185 USA

11:10 AM
DEVELOPMENT OF MULTI-MATERIAL VIRTUAL LM SIMULATION: Dan Qiu[1]; Noshir Langrana[1]; Stephen Danforth[2]; Ahmad Safari[2]; Mohson Jafari[3]; [1]Rutgers-The State University of NJ, Mech. &Aero Engineering Dept., Piscataway, NJ 08854-8058 USA; [2]Rutgers - Ceramic & Materials Engineering; [3]Rutgers - Industrial Engineering

11:30 AM
ADVANCE IN BOTH RAPID PROTOTYPING & RAPID TOOLING TECHNIQUES: *Luca Iuliano* [1]; L. Settineri[1]; A. Gatto[2]; [1]Politecnico di Torino, Dept. of Production System & Economics, Corso Duca degli Abruzzi 24, Torino 10129 Italy; [2]Universita di Ancona, Ancona Italy

Spray Forming: Session II

Tuesday AM Room: Iolani Suite V
July 14, 1998 Location: Tapa Towers

Session Chairs: Sangho Ahn, Research Institute of Industrial Science and Technology, Advanced Materials Division, Pohang 790-330 Korea; A. Leatham, Osprey Metals Ltd., Dept. of Research, Neath West, Glamorgan SA11 1NJ U.K. Wales, UK

8:30 AM INVITED PAPER
NEW ALUMINIUM CYLINDER LINERS FOR COMBUSTION ENGINES MANUFACTURED FROM SPRAY DEPOSITED - PART 1: *Klaus B. Hummert* [1]; [1]Peak Werkstoff GmbH, P. O. Box 150160, Velbert D-42620 Germany

8:50 AM
NEW ALUMINUM CYLINDER LINERS FOR COMBUSTION ENGINES MANUFACTURED FROM SPRAY DEPOSITED - PART 2

9:10 AM
PROGRESS IN CLEAN METAL SPRAY FORMING: *W. T. Carter* [1]; M. G. Benz[1]; B. A. Knudsen[1]; R. J. Zabala[1]; J. K. Browning[1]; R. M. Forbes Jones[2]; H. E. Lippard[2]; R. L. Kennedy[2]; [1]General Electric Corporate Research & Development, Schenectady, NY 12301 USA; [2]Allvac, A Division of Allegheny Teledyne Industries, Inc., Monroe, NC 28105 USA

9:30 AM
SPRAYCAST-X FOR AEROSPACE APPLICATIONS: *Dr. Thomas Tom* [1]; Kim Bowen[1]; Greg Butzer[1]; [1]Howmet Corporation, 1500 South Warner Street, Whitehall, MI 49461 USA

9:50 AM
HIGH CHROMIUM ALLOYS FOR SHIPBOARD WASTE INCINERATORS: *Rich Rebis* [1]; Leslie Kohler[1]; Craig Madden[1]; [1]US Navy, Naval Surface Warfare Center Carderock Division, Bethesda, MD 20817-5700 USA

10:10 AM
THE SPRAY FORMING AND EVALUATION OF LARGE DIAMETER BILLETS IN SPECIAL STEELS AND SUPERALLOYS: *Lee H. Shaw* [1]; Graham Oakes[1]; [1]Special Melted Products Limited, Sheffield United Kingdom

10:30 AM
TRIBOLOGICAL BEHAVIOUR OF BORIDED COATINGS PRODUCED BY VPS TECHNIQUE ON CARBON STEELS COMPONENTS: *Giorgio Pradelli* [1]; Emanuele Galvanetto[1]; Francesca Borgioli[1]; Tiberio Bacci[1]; Baldo Tesi[2]; [1]Universita di Firenze, Dipartimento di Meccanica e tecnologie Industriali, Via di S. Marta 3, Firenze 50139 Italy; [2]Universita di Trento, Trento Italy

Superplasticity and Superplastic Forming: Session II

Tuesday AM Room: Iolani Suite III
July 14, 1998 Location: Tapa Towers

Session Chairs: O. A. Kaibyshev, Institute for Metals Superplasticity, Problems of the Russian Academy of Sciences, Khalturina 450001, Russia; Yuichi Ikuhara, University of Tokyo, Department of Materials Science, Faculty of Engineering, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113 Japan

8:30 AM INVITED PAPER
SUPERPLASTICITY IN NANOMETALS, NANOINTERMETALLICS AND NANOCERAMICS SOME RESULTS AND OBSERVATIONS - PART 1: *A. K. Mukherjee* [1]; R. S. Mishra[1]; [1]University of California, Department of Chemical Engineering & Matls. Science, Davis, CA 95616 USA

8:50 AM
SUPERPLASTICITY IN NANOMETALS, NANOINTERMETALLICS AND NANOCERAMICS SOME RESULTS AND OBSERVATIONS - PART 2

9:10 AM INVITED PAPER
THERMOMECHANICAL PROCESSING OF A 6XXX ALUMINUM ALLOY FOR GRAIN-SIZE CONTROL AND SUPERPLASTICITY: *L. P. Troeger* [1]; R. Crooks[2]; E. A. Starke[1]; [1]University of Virginia, Department of Materials Science and Engineering, School of Engineering and Applied Science, Charlottesville, VA USA; [2]Analytical Services and Material, Inc., Hampton, VA, USA

9:30 AM
GRAIN SIZE CONTROL AND SUPERPLASTICITY IN Mg ALLOYS: *Mamoru Mabuchi*[1]; Takeshi Mohri[2]; Naobumi Saito[1]; Mamoru Nakamura[1]; Hajime Iwasaki[3]; Kenji Higashi[4]; [1]National Industrial Research Institute of Nagoya, Hirate-cho, Kita-ku, Nagoya 462 Japan; [2]Nagoya Municipal Industrial Research Institute, Rokuban, Atsuta-ku, Nagoya 456 Japan; [3]Himeji Institute of Technology, College of Engineering, Departments of Materials Science and Engineering, Shosha, Himeji, Hyogo 671-22 Japan; [4]Osaka Prefecture University, College of Engineering, Department of Metallurgy and Materials Science, Gakuencho, Sakai, Osaka 593 Japan

9:50 AM
SUPERPLASTIC DEFORMATION OF Al-Cu RIBBONS PRODUCED BY MELT SPUN METHOD: *Yukichi Umakoshi* [1]; Wataru Fujitani[1]; [1]Osaka University, Department of Materials Science and Engineering, Faculty of Engineering, 2-1 Yamada-oka, Suita, Osaka 565 Japan

10:10 AM
THE EFFECT OF YTTRIA CONTENT ON THE SUPERPLASTICITY OF YSZ IN THE c-t PHASE FIELD: *K. Sasaki* [1]; T. Kondoh[1]; Y. Ikuhara[1]; T. Sakuma[1]; [1]University of Tokyo, Department of Materials Science, Faculty of Engineering, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113 Japan

10:30 AM
EVALUATION OF GRAIN SIZE EFFECT ON SUPERPLASTICITY OF A Pb-Sn EUTECTIC ALLOY BASED ON THE INTERNAL VARIABLE THEORY OF STRUCTURAL SUPERPLASTICITY: *Tae Kwon Ha* [1]; Kwang Sup Shin[1]; Young Won Chang[1]; [1]Pohang University of Science and Technology, Center for Advanced Aerospace Materials (CAAM), Pohang, Kyungbuk 790-784 Korea

10:50 AM
UNIFORM POST-FORMED THICKNESS FROM MATHEMATICALLY MODELLED PROFILED BLANK: *Abhijit Dutta* [1]; [1]Defence Metallurgical Research Laboratory, Hyderabad 500 058 India

11:10 AM
SUPERPLASTICITY OF METASTABLE AUSTENITIC STAINLESS STEELS WITH ULTRA FINE GRAINS: *T. Suzaki* [1]; S. Takaki[2]; [1]Nisshin Steel Co. Ltd., Steel & Technology Development Laboratories, 11-1 Showa-cho, Kure 737 Japan; [2]Kyushu University, Department of Materials Science and Engineering, Fukuoka 812-12 Japan

TUESDAY PM

Advanced Ferrous Alloys: Session I

Tuesday PM — Room: Iolani Suite VI
July 14, 1998 — Location: Tapa Towers

Session Chairs: P. Holsberg, Naval Surface Warfare Center, Darderock Division, West Bethesda, MD 20817-5700, USA; Xishan Xie, Chinese Society for Metals, China

2:00 PM
TiB2 PARTICLE REINFORCED HIGH MODULUS STEEL: *Kouji Tanaka* [1]; Tadashi Oshima[1]; Takashi Salto[1]; [1]Toyota Central Research & Development Laboratories, Inc., 41-1 Yokomichi, Nagakute, Aichi 480-11 Japan

2:20 PM INVITED PAPER
METADYNAMIC RECRYSTALLIZATION OF 304 STAINLESS STEEL: *Sang-Hyun Cho* [1]; Yu-Seung Kim[1]; Yeon-Chul Yoo[1]; [1]Inha University, Department of Metallurgical Engineering, #253 Yonghyun-Dong, Nam-Ku, Inchon 402-751 Korea

2:40 PM
MICROSTRUCTURAL ANALYSIS OF VANADIUM BEARING HIGH MANGANESE PRECIPITATION HARDENING STAINLESS STEEL: *Y. Haruna* [1]; A. Yamamoto[2]; H. Tsubakino[2]; [1]Sanyo Special Steel Co., Ltd., Technological Research Laboratory, Himeji 672 Japan; [2]Himeji Institute of Technology, Department of Materials Science and Engineering, Faculty of Engineering, Himeji 671-22 Japan

3:00 PM
HIGH TEMPERATURE MECHANICAL PROPERTIES OF CONTINUOUSLY CAST AUSTENITIC STAINLESS STEELS: *Sun K oo Kim* [1]; Ji Joon Kim[1]; Jong Wan Kim[1]; Yong Deuk Lee[1]; T. Umeda[2]; [1]POSCO, Technical Research Lab, Kyongbuk Korea; [2]Tokyo University, Dept. of Metallurgy Graduate School of Engineering, Tokyo Japan

3:20 PM
DEFORMATION INDUCED MARTENSITIC TRANSFORMATION OF 304 STAINLESS STEEL: *Hong-Chul Shin* [1]; Tae-Kwon Ha[1]; Young-Won Chang[1]; [1]Pohang University of Science and Technology, Center for Advanced Aerospace Materials (CAAM), Pohang 790-784 Korea

3:40 PM INVITED PAPER
INFLUENCE OF HEAT TREATMENT ON THE MICROSTRUCTURE OF A C-Cr-Mo STAINLESS STEEL: *M. Mujahid* [1]; M. I. Qureshi[1]; M. Ali[1]; [1]GIK Institute of Engineering Sciences & Technology, FMME, Topi NWFP-23460 Pakistan

4:00 PM
STRUCTURE AND MECHANICAL PROPERTIES OF A ULTRA LOW CARBON/Ti-ADDED STEELS: *R. Mendoza* [1]; g. Lugo[1]; J. A. Juarez-Islas[2]; [1]Ispat Mexicana S.A. de C.V., Fco Mújica 1B, Cd. Lázaro Cárdenas, Michoacán México; [2]Ciudad Universitaria, Departamento de Materiales Metálicos y Cerámicos, Instituto de Investigación en Materiales, Circuito Exterior, México, D.F. 04510 México

4:20 PM
INTERACTION BETWEEN MELTS AND REFRACTORY IN PROCESS OF SMELTING REDUCTION WITH IRON BATH: *Qingcai Liu* [1]; [1]ChongQing University, China

Composite Materials: Session III

Tuesday PM — Room: Honolulu Suite II
July 14, 1998 — Location: Tapa Towers

Session Chairs: S. Carlos Sanday, Naval Research Lab, Code 6300, Washington, DC 20375-5343, USA; Jing Zhu, Tsinghna University, China

2:00 PM INVITED PAPER
LAMINATED METAL COMPOSITES - FRACTURE AND BALLISTIC IMPACT BEHAVIOR: *D. R. Lesuer* [1]; C. K. Syn[1]; O. D. Sherby[2]; J. Wadsworth[1]; [1]Lawrence Livermore National Laboratory, Livermore, CA 94551 USA; [2]Stanford University, Stanford, CA 94305

2:20 PM
IN-SITU OBSERVATION OF CYCLIC FATIGUE CRACK GROWTH OF SiC/SiC COMPOSITE : *S. J. Zhu* [1]; M. Mizuno[2]; Y. Mutoh[1]; Y. Kagawa[3]; [1]Nagaoka University of Technology, Nagoya Japan; [2]Japan Fine Ceramics Center, Atsuta-ku, Nagoya 456 Japan; [3]University of Tokyo Japan

2:40 PM
HIGH TEMPERATURE INTERFACE SLIDING AND DEFORMATION BEHAVIOR OF Cu-Mo ARTIFICIAL LAMELLAR COMPOSITES: *F. Yoshida* [1]; H. Nakashima[1]; [1]Kyushu University, Department of Materials Science and Technology, Graduate School of Engineering Sciences, Kasuga-shi, Fukuoka Japan

3:00 PM
WEAR OF TiC REINFORCED STEEL MATRIX COMPOSITES PRODUCED USING A P/M METHOD: *O. N. Dogan* [1]; J. A. Hawk[1]; R. D. Wilson[1]; [1]U.S. Department of Energy, Albany Research Center, Albany, OR 97321 USA

3:20 PM
FRACTURE BEHAVIOR OF POLYMER-HYSROXYAPATITE COMPOSITES: *P. Cheang* [1]; K. A. Khor[2]; [1]Nanyang Technological University, School of Applied Science, Nanyang Avenue 639798 Singapore; [2]Nanyang Technological University, School of Mechanical & Production Engineering, Nanyang Avenue, Singapore 639798 Singapore

3:40 PM
THE MECHANICAL PERFORMANCE OF METAL-MATRIX COMPOSITE JOINTS: *D. D. Brink* [1]; C. G. Levi[1]; F. A. Leckle[1]; [1]University of California, Materials Department, Santa Barbara, CA 93106-5050 USA

4:00 PM
PARTICLE REINFORCED NiAl-BASED COMPOSITES FABRICATED BY XD REACTION COMPCAST: *Rongming Wang* [1]; [1]Instutute of Aeronautical Materials, China

4:20 PM
$Al_2O_2AlB_{12}$ COMPOSITES SYNTHESIZED BY SHS: *Yin Sheng* [1]; [1]University of Science and Technology, Beijing, China

4:40 PM
CARBOTHERMIC REDUCTION OF ILMENITE AND TANTALITE IN IRON TO PRODUCE METAL MATRIX COMPOSITES: *O. S. Chinyamakobru* ; N. T. Mudzarapabowe

General Abstracts: Session II

Tuesday PM Room: Iolani Suite I
July 14, 1998 Location: Tapa Towers

Session Chairs: C. M. Gilmore, George Washington University, Institute for Materials Science, Washington, DC 20052, USA; Akihisa Inoue, Tohoku University, Institute for Materials Research, Sendai 980-77 Japan

2:00 PM
A STUDY ON THE LOW TEMPERATURE CRYSTALLIZATION OF a-Si FILMS IN CONTACT WITH Al or Pd PREPARED BY SPUTTERING METHOD: *Hae-Yeol Kim* [1]; Yoon-Joon Yong[1]; Jai-Young Lee[1]; [1]Korea Advanced Institute of Science and Technology, Department of Materials Science and Engineering, 373-1 Kusong Dong, Yusong Gu, Taejon 305-701 South Korea

2:20 PM
HYDROGEN INDUCED CRACKING IN AMORPHOUS ALLOYS: *N. Eliaz* [1]; [1]University of Nagev, Dept. of Materials Eng., P.O.B. 653, Beer Sheva 84105 Israel

2:40 PM
FRACTAL DIFFUSION SIMULATION ON CATALYTIC SURFACES: *M. Zamani Mehr* [1]; M. Majidi[1]; [1]Islamic Azad University of Karaj, Plasma Physics Research Center of I.A.U. Tehran, #116 Mehrville, Bozorgmehr, Karaj 31376 Iran

3:00 PM INVITED PAPER
PRODUCTION OF ALUMINA FROM EGYPTIAN KAOLINITE: *A. M. Abdel-Rehim* [1]; [1]Alexandria University, 69 Sultan Hussein Str., Shallalat, Alexandria Egypt

3:20 PM INVITED PAPER
HIGH TEMPERATURE CREEP DEFORMATION: A GENERIC ANALYSIS: *S. S. Bhattacharya* [1]; K. A. Padmanabhan[1]; [1]Indian Institute of Technology, Department of Metallurgical Engineering, Materials Testing Facility, Metal Forming Laboratory, Madras, Chennai 600 036 India

3:40 PM
ELECTRON-BEAM SKULL MELTING AND CASTING OF Ti- AND Ni-BASED ALLOYS: *S. Ladokhin* [1]; [1]Physico-Technological Institute of Metals and Alloys, 34/1 Vernadsky Ave., Kiev -142 252680 Ukraine

4:00 PM
PERFORMANCE TEST OF CHEMICAL HEAT PUMP WITH MH MATERIALS FOR IS HYDROGEN PRODUCTION CHEMICAL PROCESS IN HIGH TEMPERATURE GAS COOLED REACTOR SYSTEM: *S. Ishiyama* [1]; [1]Japan Atomic Energy Research Institute, Jaeri

4:20 PM
EVALUATION OF THE FATIGUE BEHAVIOR OF SQUEEZE CAST A380.0 ALLOY: *Jerald R. Brevick*[1]; Herb G. Brucher[1]; Patrick S. Cheng[1]; [1]Ohio State University, Department of Industrial, Welding and Systems Department Engineering, 210 Baker Systems, 1971 Neil Avenue, Columbus, OH 43210-1271 USA

Intermetallics: Session III

Tuesday PM Room: Tapa Ballroom III
July 14, 1998 Location: Tapa Towers

Session Chairs: Zengyong Zhong, China; S. W. Nam, Korea Advanced Institute of Science and Technology, Korea

2:00 PM INVITED PAPER
PHASE STRUCTURE OF RAPIDLY SOLIDIFIED Al-RICH Ni-Al PRECURSOR ALLOYS FOR CATALYSIS: *Ningfu Shen* [1]; [1]Zhengzhou University of Technology

2:20 PM
PHASE EQUILIBRIA AND PHASE STABILITY AMONG β, α, α_2 and γ PHASES IN Ti-Al-M TERNARY SYSTEMS AT ELEVATED TEMPERATURES : *S. Kobayashi* [1]; M. Takeyama[1]; T. Matsuo[1]; M. Kikuchi[1]; [1]Tokyo Institute of Technology, Department of Metallurgical Engineering, 2-12-1 Ookayama, Meguro-ku, Tokyo 152 Japan

2:40 PM
REACTIVE SINTERING OF NiAl AND SIMULTANEOUS JOINING TO STEEL: *Kiyotaka Matsuura* [1]; Ken-ichi Ohsasa[1]; Noritoshi Sueoka[1]; Masayuki Kudoh[1]; [1]Hokkaido University, Division of Materials Science and Engineering, Kita-ku, Sapporo, Hokkaido 060 Japan

3:00 PM
CHARACTERIZATION OF FeAl INTERMETALLIC COMPOUND IN THE PROCESS OF MECHANICAL ALLOYING: *Mitsuya Hashii* [1]; Yuzo Hosoi[2]; [1]Nagoya Municipal Industrial Research Institute, 3-4-31 Rokuban, Atsuta-ku, Nagoya 456 Japan; [2]Daido Institute of Technology, Department of Mechanical Engineering, 2-21 Daido-cho, Minami-ku, Nagoya Japan

3:20 PM
THERMAL CONDUCTIVITY IN INTERMETALLIC COMPOUNDS: *Yoshihiro Terada* [1]; Mohri Tetsuo[1]; Tomoo Suzuki[2]; [1]Hokkaido University, Division of Materials Science and Engineering, Kita-ku, Sapporo 060-0813 Japan; [2]Kochi University of Technology, Tosayamada, Kochi 782-0003 Japan

3:40 PM
DEFORMATION AND FRACTURE OF Bi-PST CRYSTALS OF TiA: *D. Imamura*[1]; H. Hoshikawa[1]; K. Kishida[1]; H. Inui[1]; M. Yamaguchi[1]; [1]Kyotoa University, Department of Materials Science and Engineering, Kyoto 606-01 Japan

4:00 PM
Ti45 Al55-Nb45 Al55 VERTICAL SECTION OF Ti-Al-Nb SYSTEM: *Xitao Wang* [1]; Gouliang Chen[1]; Kequan Ni[1]; Shiming Hao[1]; [1]University of Science and Technology, Beijing, China

4:20 PM
A STUDY ON THE CHROMIUM MODIFIED Ni-25Al-27.5Fe INTERMETALLICS: *Chun-Huei Tsaul* [1]; Jason Shian-Ching Jang[2]; Jin-Wei Yeh[3]; [1]Industrial Technology Research Institute, Materials Research Laboratories, Taiwan; [2]I-So Institute, Department of Materials Science and Engineering, Taiwan USA; [3]National Tsing Hua University, Department of Materials Science and Engineering, Taiwan

Light Metals: Session III

Tuesday PM Room: Honolulu Suite III
July 14, 1998 Location: Tapa Towers

Session Chairs: Chenggong Li, BIAM, Beijing, China; S. B. Kang, KIMM, Changwon, Korea

2:00 PM INVITED PAPER
ADVANCES IN DEFORMATION MECHANISMS OF TITANIUM ALLOYS: *A. Ramesh* [1]; S. Ankem[1]; [1]University of Maryland, Department of Materials and Nuclear, College Park, MD 20742-2115 USA

2:20 PM INVITED PAPER
THERMOMECHANICAL PROCESSING OF Ti-BASED MATERIALS: *L. Christodoulou* [1]; R. J. Dashwood[1]; [1]Imperial College, Department of Materials, Prince Consort Road, London SW7 2BP UK

2:40 PM
RHEOLOGY OF ALUMINIUM ALLOY AlSi7MgO.3Sr IN ITS SEMI-SOLID STATE: *F. C. Yee* [1]; X P Niu[1]; S. W. Hao[1]; B. H. Hu[1]; [1]Gintic Institute of Manufacturing Technology, 71 Nanyang Drive, Singapore Republic of Singapore

3:00 PM
DEFORMATION AND FRACTURE BEHAVIOR OF Al-Mg-Si ALLOYS: *S. B. Kang* [1]; L. Zhen[2]; H. W. Kim[1]; S. T. Lee[3]; [1]Korea Institute of Machinery and Materials, Changwon 641-010 Korea; [2]Harbin Institute of Technology, P.O.Box 433, Harbin 150001 P.R.China; [3]Aluminum of Korea Ltd., Ulsan 680-090 Korea

3:20 PM
TB2 TITANIUM ALLOYS FOR SATELLITE AND ROCKET CONNECTION BELT: *Haishen Chen* [1]; [1]General Research Institute of Nonferrous Metals, Beijing China

3:40 PM
COMBINES MECHANICAL ALLOYING AND COMBUSTION SYNTHESIS IN THE TiH2-B SYSTEM: *S. Ozbilen* [1]; [1]Gazi University of Technical Education, Metallurgical Education Dept., Teknikikullar, Ankara Turkey

4:00 PM
CONTROLLED COMBUSTION SYNTHESIS IN THE TiH2-B SYSTEM: *S. Ozbilen* [1]; [1]Gazi University, Fax. of Tech. Educ., Metallurgical Educ. Dept., Ankara Turkey

4:20 PM
INTERFACIAL REACTIONS BETWEEN CP-Ti AND ZrO_2(5C): *Lin Kun-Fung* [1]; C. C. Lin[1]; G.Y. Ni[2]; J. I. Wang[2]; [1]National Chiao Tung University, Department of Material Science and Engineering, National Chiao Tung University, Department of Material Science and Engineering, Hsinchu, Taiwan 300 Republic of China; [2]Chung-Shang Institute of Science and Technology, P.O. Box 90008-8-4, Tao-Yuan, Taiwan Republic of China

4:40 PM
OXIDATION BEHAVIOR AND THERMAL STABILITY OF Ti-44Al-11Nb ALLOY: *R. Mahapatra* [1]; S. K. Varma[2]; B. A. Pregger[1]; W. E. Frazier[1]; [1]Naval Air Warfare Center, Aircraft Division (NAWCAD), Patuxent River, MD 20670 USA; [2]The University of Texas at El Paso, Department of Metallurgical and Materials Engineering, El Paso, TX 79968-0520 USA

Magnetic Materials: Session III

Tuesday PM Room: Honolulu Suite I
July 14, 1998 Location: Tapa Towers

Session Chairs: Nack J. Kim, Korea; O. Nittono, Japan

2:00 PM INVITED PAPER
PROPERTIES OF NANO REGIONS AND BOUNDARIES IN FERROELECTRICS: *A. S. Bhalla* [1]; [1]Penn State, University Park, PA 16802 USA

2:20 PM INVITED PAPER
MAGNETIC PROPERTIES AND STRUCTURE OF ULTRAFINE AMORPHOUS Fe-Zr-B POWDERS OBTAINED BY CHEMICAL REDUCTION: *Jingguo Zhang* [1]; [1]Shanghai Iron & Steel Research Institute, Shanghai, China

2:40 PM
ELECTRICAL & MECHANICAL PROPERTIES OF PEROVSKITE o-d FERROELECTRIC RELAXORS $Pb(InNb)O_3$ AND $Pb(ScNb)O_3$: $PbTiO_3$ SYSTEMS: *E. Alberta* [1]; A. Bhalla[1]; [1]Penn State, University Park, PA 16802 USA

3:00 PM
EFFECTS OF HARD-MAGNET BIAS ON CORE LOSS OF MnZn FERRITE: *Yutaka Yamamoto* [1]; Akihiro Makino[1]; Kinshirou Takadate[1]; [1]Japan

3:20 PM
EFFECT OF ADDITIONAL ELEMENTS (M=TRANSITION METAL) ON THE THERMAL STABILITY AND SOFT MAGNETIC PROPERTIES IN Fe-Co- Ni-Zr-M-B AMORPHOUS ALLOYS WITH WIDE SUPERCOOLED LIQUID RANGE: *H. Koshiba* [1]; [1]Tohoku University, Sendai Japan

3:40 PM
MAGNETIC FIELD INDUCED ANISOTROPHY OF NANOCRYSTALLINE SOFT MAGNETIC Fe-Zr-B "NANOPERM": *Teruo Bitoh* [1]; [1]Alps Electric Co., Ltd.

4:00 PM
STRUCTURE AND MAGNETIC PROPERTIES OF Co-Fe-Hf-O SPUTTERED FILMS WITH HIGH ELECTRICAL RESISTIVITY: *Y. Sasaki* [1]; [1]Alps Electric Company Co. Ltd.

4:20 PM
STRUCTURAL AND MAGNETIC CHARACTERIZATION OF Fe-N FILMS PREPARED BY A REACTIVE SPUTTERING METHOD: *M. Shibata* [1]; S. Shi[1]; M. Hashimoto[1]; [1]University of Electro-Communications, Department of Applied Physics and Chemistry, 1-5-1, Chofugaoka, Chofu 182 Japan

4:40 PM
EFFECT OF SOLID REDUCING AGENT ON FORMATIVE CONDITION AND MAGNETIC PROPERTIES OF Fe_2-W TYPE HEXAGONAL FERRITE: *H. Takamura* [1]; K. Unno[1]; A. Kamegawa[1]; M. Homma[1]; M. Okada[1]; [1]Tohoku University, Department of Materials Science, Graduate School of Engineering, Aoba, Aramaki, Aoba-ku, Sendai 980-77 Japan

5:00 PM
EFFECTS OF SURFACE FEATURES OF AMORPHOUS RIBBONS ON THE IN-PLANE MAGNETIC ANISOTROPHY: *Hongxia Wang* [1]; [1]The National Amorphous Nanocrystalline Alloy Engineering Research Center, China

Phase Transformations and Their Applications: Session III

Tuesday PM Room: Tapa Ballroom II
July 14, 1998 Location: Tapa Towers

Session Chairs: C. T. Liu, Oak Ridge National Lab., Oak Ridge, TN 37831-6115, USA; Masahiko Yamamoto, Osaka University, Department of Materials Science & Engineering, Japan

2:00 PM INVITED PAPER
AN APPRAISAL OF SINGLE CRYSTAL CASTING FOR TURBINE COMPONENTS: *P. Aubur tin* [1]; S. L. Cockcroft[1]; A. Mitchell[1]; W. Tao[1]; [1]University of British Columbia, Dept. of Metals and Materials Engineering, Advanced Materials and Processing Laboratory, Vancouver, BC V6T 1Z4 Canada

2:20 PM
ORDERING PROCESSES IN AN Al-Li-Cu-Mg-Zr ALLOY: *Y. Ohmori* [1]; S. Ito[1]; K. Nakai[1]; [1]Ehime University, Department of Materials Science & Engineering, 3 Bunkyo-cho, Matsuyama 790 Japan

2:40 PM
LINEAR AND STE-DISCLINATIONS CONSISTING OF MULTIPLE TWIN BOUNDARIES IN THE $L1_1$-TYPE CuPt ORDERED ALLOY: *Y. Kitano* [1]; K. Kitasaka[2]; [1]Shimane University, Matsue 690-0031 Japan; [2]Betsukawa Corporation, Matto Yatsukaho 1-5, Ishikawa 924 Japan

3:00 PM
MODIFICATION OF ELECTRONIC STRUCTURE DUE TO LOCAL ATOMIC DISPLACEMENTS AROUND CARBON INTERSTIAL IN AUSTENITE: *Hiroshi Yukaw a* [1]; Masahiro Mori[1]; Masahiko Morinaga[1]; [1]Nagoya University, Department of Materials Science and Engineering, Furo-cho, Chikusa-ku, Nagoya 464-01 Japan

3:20 PM
REAL TIME CHARACTERIZATION OF SOLID/LIQUID INTERFACES DURING DIRECTIONAL SOLIDIFICATION: *S. Sen* [1]; W. K. Kaukler[2]; P. A. Curreri[3]; P. Peters[3]; [1]USRA/NASA Marshall Space Flight Center, Huntsville, AL 35812 USA; [2]University of Alabama, CMMR, Huntsville, AL 35899 USA; [3]NASA Marshall Space Flight Center, Huntsville, AL 35812 USA

3:40 PM
PHASE TRANSFORMATION BEHAVIOR AND REDUCING GAS SENSING CHARACTERISTICS OF Fe-O THIN FILM PROCESSED BY PLASMA-ENHANCED CHEMICAL VAPOR DEPOSITION: *Bum-Jin Kim* [1]; Eun-Tae Lee[1]; Gun-Eik Jang[1]; [1]Chungbuk National University, Department of Materials Engineering, Cheongju, Chungbuk 360-763 Korea

4:00 PM
SHAPE CASTING SIMULATION: COUPLING MICROSTRUCTURAL MODELS INTO MACROMODELS FOR THE PREDICTION OF PROPERTIES: *A. Giac hino* [1]; P. D. Lee[1]; L. Christodoulou[1]; S. Nishido[2]; [1]Imperial College, Department of Materials, Prince Consort Road, London SW7 2BP UK; [2]Aisin Takaoka Co. Ltd., 1 Tennoh, Takaokashin-machi, Toyota, Aichi Japan

4:20 PM
CRYSTALLINE-AMORPHOUS TRANSFORMATION IN C15 LAVES PHASE $TbFe_2$ BY HYDROGEN ABSORPTION: K. Mori[1]; *K. Aoki* [2]; T. Masumoto[3]; [1]Mitsubishi Materials Corporation, Omiya, Saitama 330 Japan; [2]Kitami Institute of Technology, Kitami, Hokkaido 090 Japan; [3]Tohoku University, Institute for Materials Research, Sendai 980-77 Japan

4:40 PM
MICROSTRUCTURE AND CURIE TEMPERATURE OF As CAST Fe-(Nd+MM)-B ALLOYS: *Cleber Santiago Alves* [1]; Thesis Mac[1]; [1]Universidade Estadual de Company, Unicamp SP Brazil

Spray Forming: Session III

Tuesday PM Room: Iolani Suite V
July 14, 1998 Location: Tapa Towers

Session Chairs: E. J. Lavernia, University of California, Department of Chemistry & Biochemistry Engineering & Materials Science, Irvine, CA 92697-2575 USA; Toru Miyazaki, Nagoya Institute of Technology, Department of Materials, Nagoya 466 Japan

2:00 PM INVITED PAPER
SPRAY FORMING COMMERCIAL PRODUCTS: PROCESS DESIGN AND OPTIMIZATION - PART 1: *A. Lawle y* [1]; R. D. Doherty[1]; R. G. Brooks[1]; [1]Drexel University, Department of Materials Engineering, Philadelphia, PA 19103 USA

2:20 PM
SPRAY FORMING COMMERCIAL PRODUCTS: PROCESS DESIGN AND OPTIMIZATION - PART 2

2:40 PM INVITED PAPER
MODELING OF THE THERMAL HISTORY OF THE SOLIDIFICATION OF NON-SPHERICAL MOLTEN METAL DROPLET DURING SPRAY FORMING: *Y. C. Chen* [1]; C. -Y. A. Tsao[1]; [1]National Cheng Kung University, Department of Materials Science and Engineering, Tainan, Taiwan R.O.C.

3:00 PM
SIMULATION OF SOLIDIFICATION BEHAVIOR WITHIN DEPOSITED PREFORM DURING SPRAY FORMING PROCESSING: *J. S. Zhang* [1]; [1]University of Science and Technology, Beijing, China

3:20 PM
NUMERICAL METHOD FOR THE DEPOSITION PROFILES IN SPRAY FORMING PROCESS: *Xiaow ei Fu* [1]; [1]University of Science and Technology, Beijing, China

3:40 PM
MICROSTRUCTURE AND YIELD STRENGTH OF Cu-TiB_2 ALLOY PRODUCED BY SPRAY FORMING: *Jongsang Lee* [1]; Eon-Sik Lee[2]; Sangho Ahn[2]; Nack J. Kim[1]; [1]Pohang University of Science and Technology, Center for Advanced Aerospace Materials, Pohang 790-784 Korea; [2]Research Institute of Industrial Science and Technology, Advanced Materials Division, Pohang 790-330 Korea

4:00 PM
MODELING OF MULTI-PHASE TRANSPORT PHENOMENA IN A SPRAY FORMING PROCESS AND THE CONDITIONS OF POROSITY IN THE BULK DEPOSITS: *S. J. Pien* [1]; M. G. Chu[1]; [1]Alcoa Company of America, Alcoa Technical Center, Alcoa Center, PA 15069 USA

4:20 PM
SELECTION OF GAS AND DROPLET PROPERTIES IN THE MODELING OF SPRAY ATOMIZATION PROCESS: *Bing Li* [1]; Enrique J. Lavernia[1]; [1]University of California, Department of Chemical & Biochemical Engineering and Materials Science, Irvine, CA 92697-2575 USA

Superplasticity and Superplastic Forming: Session III

Tuesday PM Room: Iolani Suite III
July 14, 1998 Location: Tapa Towers

Session Chairs: K. Higashi, Osaka Prefecture University, Department of Metallurgy and Materials Science, Gakuen-cho, Sakai 593 Japan; A. Dutta, Defense Metal. Res. Lab., Hyderabad 500-058, India

2:00 PM INVITED PAPER
TEMPERATURE DEPENDENCE OF THRESHOLD STRESS FOR HIGH STRAIN-RATE SUPERPLASTICITY OF Al-BASED MATERIALS: *Dongw ha Kum* [1]; Woo-Jin Kim[2]; [1]Korea Institute of Science and Technology, Division of Metals, P.O. Box 131, Cheongryang, Seoul 130-650 Korea; [2]Hong-IK University, Department of Materials and Engineering, 72-1 Sangsu-dong, Mapo-ku, Seoul 121-791 Korea

2:20 PM
EXPERIMENTAL RELATIONS BETWEEN MAXIMUM GAP AND DEPTH OF THE MOLD DURING SUPERPLASTIC FORMING: *G. Torres-V illaseñor* [1]; H. Aguilar[1]; J. Llanes[1]; [1]Universidad Nacional Autónoma de México, Instituto de Investigaciones en Materiales, Apdo. P 70-360, México D.F. 04510 Mexico

2:40 PM
EXPERIMENTAL ANALYSIS OF SUPERPLASTIC DEFORMATION MECHANISMS IN A COMMERCIAL 5083 ALLOY: *Hajime Iwasaki* [1]; [1]Himeji Institute of Technology, Department of Materials Science and Engineering, 2167 Shosha, Himeji, Hyogo 671-22 Japan

3:00 PM
GRAIN REFINEMENT AND POTENTIAL FOR SUPERPLASTICITY IN Al ALLOYS CONTAINING SMALL PARTICLES: *Z. Horita* [1]; M. Furukawa[2]; M. Nemoto[1]; T. G. Langdon[3]; [1]Kyushu University, Department of Materials Science and Engineering, Faculty of Engineering, Fukuoka 812-86 Japan; [2]Fukuoka University of Education, Department of Technology, Munakata, Fukuoka 811-41 Japan; [3]University of Southern California, Department of Materials Science and Mechanical Engineering, Los Angeles, CA

3:20 PM INVITED PAPER
TENSILE DUCTILITY OF SILICON CARBIDE AT ELEVATED TEMPERATURE: *Takayuki Na gano* [1]; Sawao Honda[1]; Fumihiro Wakai[1]; Hironori Kodama[2]; [1]Japan Science and Technology Corporation, ICORP, Ceramics Superplasticity Project, 2-4-1, Mutusno, Atsuta-ku, Nagoya 456 Japan; [2]Hitachi Ltd., Production Engineering Research Laboratory, 292, Yoshida-cho, Totsuka-ku, Yokahama 244 Japan

3:40 PM
SUPERPLASTIC BEHAVIOR OF DOUBLY-EXTRUDED ZK60/SiC/17p MAGNESIUM-BASED COMPOSITE IN A WIDE RANGE OF TEMPERATURE: *T. Mukai* [1]; T. G. Nieh[2]; K. Higashi[3]; [1]Osaka Municipal Technical Research Institute, Morinomiya Joto-ku, Osaka 536 Japan; [2]Lawrence Livermore National Laboratory, L-369, P.O. Box 808, Livermore, CA; [3]Osaka Prefecture University, Department of Metallurgy and Materials Engineering, College of Engineering, Sakai, Osaka 593 Japan

4:00 PM
HIGH STRAIN-RATE SUPERPLASTICITY OF SUPERCOOLED LIQUID IN Zr AND La METALLIC GLASSES: *Y. Kaw amur a*[1]; Toshihiro Nakamura[1]; Akihisa Inoue[1]; [1]Tohoku University, Institute for Materials Research, Sendai 980-77 Japan

4:20 PM
MICROSCOPIC OBSERVATION OF SUPERPLASTIC DEFORMATION IN A Ti_3Al-Nb TWO-PHASE ALLOY: *Jin-Hong Kim* [1]; Chan-Gyung Park[1]; Tae-Kwon Ha[1]; Young-Won Chang[1]; [1]Center for Advanced Aerospace Materials, Dept. of Material Science and Engineering, Postech Korea

4:40 PM
SUPERPLASTIC BEHAVIOR AND INFLUENCE OF SOLUTION HARDENING ON THE DUCTILITY OF Al-Mg-X ALLOYS: *Byung Sun Chung* [1]; Duck Young Maeng[1]; Sun Ig Hong[1]; [1]Chungnam National University, Department of Metallurgical Engineering and RASOM, Taedok Science Town, Taejon Korea

WEDNESDAY AM

Advanced Ferrous Alloys: Session II

Wednesday AM Room: Iolani Suite VI
July 15, 1998 Location: Tapa Towers

Session Chairs: Y. Ohmori, Ehime University, Japan; M. Mujahid, GIK Institute of Engineering Science & Technology, Faculty of Metallurgy and Materials Engineering 23460, Pakistan

8:30 AM INVITED PAPER
THE EFFECT OF THE TITANIUM TRACES ON THE MECHANICAL PROPERTIES OF AN ULTRA HIGH STRENGTH STEEL: *Ruis Camar go Tokimatsu* [1]; Paulo Iris Ferreira[2]; Itamar Ferreira[2]; [1]UNESP, Department of Mechanical Engineering, Av. Brasil Centro, 56, 15378-000, Ilha Solteira, SP Brazil; [2]College of Mechanical Engineering/UNICAMP, Department of Materials Engineering, P.O. Box 6122, Caminas Brazil, SP 13083-970

8:50 AM
MICROSTRUCTURE AND MECHANICAL PROPERTIES OF HIGH STRAIN PM PROCESSED SUS316L STAINLESS STEEL: *K. Ameyama* [1]; S. Seno[1]; J. Sudo[2]; K. Nakata[2]; O. Okada[2]; [1]Ritumeikan University, Department of Mechanical Engineering, Faculty of Science and Engineering, 1-1-1 Norji-higashi, Kusatsu, Shiga 525-77 Japan; [2]Hitachi Ltd., Hitachi Research Laboratory, Hitachi, Ibaraki 317 Japan

9:10 AM
THE EFFECTS OF MICROSTRUCTURE AND PRESTRAIN ON FATIGUE STRENGTH OF DUAL-PHASE STEELS: *Katsumi Nakajima* [1]; Tetsuya Taki[1]; Takashi Miyata[1]; [1]Nagoya University, Department of Materials Science and Engineering, Nagoya 464-01 Japan

9:30 AM
EFFECT OF RETAINED AUSTENITE ON STRENGTH AND ELONGATION IN METASTABLE AUSTENITIC STAINLESS STEELS: *Kouki Tomimur a*[1]; Katsuhisa Miyakusu[1]; Sadao Hirotsu[1]; [1]Nisshin Steel Co., Ltd., Stainless Steel & High Alloy Dept., Steel & Technology Development Laboratories, Shin Nanyo City, Yamaguhi Pref 746 Japan

9:50 AM
EFFECT OF NITRIGEN ADDITION ON CORROSION PROPERTIES IN Ni-FREE STAINLESS STEELS: *M. Matsushima* [1]; Y. Tomota[2]; H. Sato[3]; K. Inoue[2]; [1]NIDAK Co. Kamitezuna, Takahagi, Ibaraki; [2]University of Washington, Department of Materials Science and Engineering, Box 352120, Seattle, WA 98195-2120 USA; [3]Ibaraki University, Department of Materials Science, Nakanarusawa-cho, Hitachi, Ibaraki 4-12-1

10:10 AM
A NEW DEVELOPMENT OF IMPROVING GRAIN ORIENTED SILICON STEEL WITH THE LLSA METHOD: *Fengliu Sun* [1]; [1]Northeastern University, Shenyang, China

10:30 AM
EFFECT OF PROCESS CONDITION ON TEXTURE AND PROPERTIES IN IF STEEL SHEET: *Bing yu K ong* [1]; [1]Iron & Steel Research Institute China

10:50 AM
A NOW MATERIAL FOR THE TROLLEY AND CONTACT CABLE: *Hongquan Weo* [1]; [1]Shanghai University, Institute of Mater. Sci. & Eng., Shanghai China

11:10 AM
MECHANISM OF DECREASING THE SLAB REHEATING TEMPERATURE OF Hi-B STEELS BY THE ADDITION OF Mo: *Zhao Yu*[1]; [1]Central Iron & Steel Research Institute, Beijing China

11:30 AM
EVALUATION OF THE FRACTURE TOUGHNESS AND LOW AND HIGH CYCLE FATIGUE PROPERTIES OF A Cr-Mn-N AUSTENITIC STAINLESS STEEL: *L. V. Vareda* [1]; D. Spinelli[1]; [1]University of Sao Paulo, Department of Engineering Materials, Engineering School of Sao Carlos, Sao Carlos SP Brazil

Composite Materials: Session IV

Wednesday AM Room: Honolulu Suite II
July 15, 1998 Location: Tapa Towers

Session Chairs: Alex Mitchell, University of British Columbia, Department of Metals & Materials Eng., Vancover, Canada V6T 1Z4 BC; Soon H. Hong, Korean Advanced Institute Sci. & Tech., Korea

8:30 AM INVITED PAPER
SYNTHESIS AND CHARACTERIZATION OF TITANIUM ALUMINIDE BASED ALLOYS WITH NANOCRYSTALLINE AND BIMODAL STRUCTURES: *N. Srisukhumbowornchai* [1]; O. N. Senkov[1]; F. H. Froes[1]; [1]University of Idaho, Institute for Materials and Processes, Moscow, ID 83844-3026 USA

8:50 AM
PROCESSING OF Al/Al3Ti COMPOSITES BY LOW PRESSURE CASTING-COMBUSTION SYNTHESIS PROCESS (LCCS PROCESS): *Kiyoshi Mizuuc hi*[1]; Takashi Takenchi[1]; Masao Fukusumi[1]; Masami Sugioka[1]; Yoshihira Okanda[1]; Hiroshi Nagai[2]; Kanryu Inoue[3]; [1]Osaka Municipal Technical Research Institute, Osaka 536 Japan; [2]Graduate School of Osaka University, Material Science and Processing, Suita 565 Japan; [3]University of Washington, Materials Science and Engineering, Seattle, WA 981195-2120 USA

9:10 AM INVITED PAPER
ANALYSIS OF BINDERS AND BINDER BURNOUT IN TAPE CAST Ti/Sic MMCS: *C. M. Lobley* [1]; Z. X. Guo[1]; [1]University of London, Department of Materials, Queen Mary & Westfield College, Mile End Road, London E1 4NS United Kingdom

9:30 AM INVITED PAPER
THE INITIATION AND CONTINUATION OF NFILTRATION Al-Mg BASED ALLOYS INTO ALUMINA PREFORMS: *B. Srinvasa Rao*[1]; [1]Indian Institute of Science, Department of Metallurgy, Bangalore 560 012 India

9:50 AM
DAMPING CAPACITY OF EPOXY FILLED ALUMINUM FOAM: *Catherine Wong* [1]; [1]Naval Surface Warfare Center, Carderock Division Code 612, 9500 MacArthur Blvd., West Bethesda, MD 20817-5700 USA

10:10 AM
THE EFFECT OF A FUNCTIONALLY GRADED PROTECTIVE COATING FOR SiC MONOFILAMENTS ON COMPOSITE MECHANICAL BEHAVIOR: *S. Haque* [1]; [1]Imperial College of Science, Technology and Medicine, Department of Materials, Prince Consort Road, London SW7 2BP United Kingdom

10:30 AM
BOND BETWEEN CONCRETE AND STEEL REINFORCEMENTS: *W. Sha* [1]; K. W. Lau[1]; M. J. Gould[1]; [1]The Queen's University of Belfast, Department of Civil Engineering, Belfast BT7 1NN UK

10:50 AM
INTERFACIAL STRESSES AND VOID NUCLEATION IN DISCONTINUOUSLY REINFORCED COMPOSITES: *Calvin Tszeng* [1]; [1]University of Nebraska-Lincoln, Department of Mechanical Engineering, Lincoln, NB 68588-0656 USA

General Abstracts: Session III

Wednesday AM Room: Iolani Suite I
July 15, 1998 Location: Tapa Towers

Session Chairs: Kyu Hwan Oh, Seoul, Korea; M. Okada, Tohoku University, Department of Materials Science, Sendai, Japan

8:30 AM
THE REACTIVE LIQUID PROCESSING OF METAL MATRIX COMPOSITES: *V. M. K evor kijan* [1]; [1]Lackova 139, Limbus Slovenia

8:50 AM
ION BOMBARDMENT EFFECT UPON STRUCTURE OF CARBON FILM ON THE SURFACE OF Ni-C ALLOY: *S. Yu Zaginaic henko* [1]; Z. A. Matysina[1]; V. N. Lnyanoi[2]; [1]Institute for Problems of Materials Science of NAS, Kiev 252680 Ukraine; [2]State University, Dnepropetrovsk 320000 Ukraine

9:10 AM
RECOVERY OF PURE MnO_2 FROM MEDIUM GRADE LOCAL MANGANESE ORES: *M. B. Morsi* [1]; [1]Central Metallurgical Research & Development Institute (CMRDI), Pyrometallurgy Lab., P.O. Box 87, Helwan, Cairo Egypt

9:30 AM INVITED PAPER
BENDING RESIDUAL STRENGTH AFTER IMPACT LOADING OF WET-LAMINATED SANDWICH CONSTRUCTION: *Bondan Tiara Sofyan* [1]; Rochim Suratman[2]; Desianti A. Budiwati[1]; [1]University of Indonesia, Department of Metallurgy, Facility of Engineering, Kampus UI, Depok 16424 Indonesia; [2]Bending Institute of Technology, Dept. of Mechanical Eng., Bandung, Indonesia

9:50 AM
RAMAN AND OPTICAL INVESTIGATIONS OF Ga-DOPED ZINC OXIDE FILMS AND NANO-PARTICALS: *S. K. Sharma* [1]; G. J. Exarhos[1]; [1]University of Hawaii, Hawaii Institute of Geophysics and Planetology, School of Ocean and Earth Science and Technology, 2525 Correa Road, Honolulu, HI 96822 USA

10:10 AM
THE METHODOLOGY OF HIGH TEMPERATURE OXIDATION IN INCOLOY 625: *Fazal A. Khalid* [1]; [1]GIK Institute of Eng. & Tech.,

Topi, NWFP Pakistan

10:30 AM
RECENT ADVANCES IN FATIGUE RESEARCH: *K. Sadananda* [1]; [1]NRL, Washington, DC USA

10:50 AM
COARSENING OF Cr PRECIPITATES IN B2-ORDERED NiAl: *E. Tsutsumi* [1]; K. Oh-ishi[1]; Z. Horita[1]; M. Nemoto[1]; [1]Kyushu University, Dept. Materials Science and Engineering, Fukuoka 812-81 Japan

Light Metals: Session IV

Wednesday AM Room: Honolulu Suite III
July 15, 1998 Location: Tapa Towers

Session Chairs: S. Ankem, University of Maryland, Department of Materials & Nuclear Engineering, College Park, MD 20742-2115, USA; Yafang Han, Institute of Aeronautical Mat., Beijing, China

8:30 AM INVITED PAPER
AN ANALYSIS OF THE MICROSTRUCTURE OBTAINED IN ATOMIZED Al-Fe POWDERS: *J. A. Juarez-Islas* [1]; C. Gonzalez-Rivera[1]; Y. Zhou[2]; E. J. Lavernia[2]; [1]Instituto de Investigaciones en Materiales, UNAM, Departamento de Materiales Metálicos y Cerámicos, Circuito Exterior, México, D.F. 04510 Mexico; [2]University of California, Department of Chemical Engineering and Materials Science, Irvine, CA 92697-2575 USA

8:50 AM
EFFECTS OF READDITION ON FORMABILITY IN Al-HIGH Mg ALLOYS: *Su-Dong Park* [1]; Suk-Bong Kang[2]; Hyun-Kee Cho[1]; [1]Kyungpook National University, Department of Metallurgical Engineering, Taegu Korea; [2]Korean Institute of Machinery & Metals, Changwon 641-010 Korea

9:10 AM
MICROSTRUCTURE AND MECHANICAL PROPERTIES OF Ti-48Al-2Nb-2Cr ALLOY AFTER THERMOMECHANICAL PROCESSING: *G. A. Salishchev* [1]; R. M. Imaev[1]; V. M. Imaev[1]; M. R. Shagiev[1]; A. V. Kuznetsov[1]; O. N. Senkov[1]; F. H. Froes[1]; [1]University of Idaho

9:30 AM
MICROSTRUCTURE AND PROPERTIES OF ALUMINUM-IRON ALLOYS SUBJECTED TO SEVERE PLASTIC DEFORMATION AND AGING: *O. N. Senkov* [1]; F. H. Froes[1]; V. V. Stolyarov[1]; R. Z. Valiev[1]; J. Liu[1]; [1]University of Idaho

9:50 AM
BEHAVIOR OF HYDROGEN IN A 5083 ALUMINUM ALLOY: *Tomoaki Ihara* [1]; Goroh Itoh[1]; [1]Nagaoka University of Technology, Kami-Tomioka, Nagaoka, Niigata-pref. 940-21 Japan

10:10 AM
MICROSTRUCTURE REFINEMENT OF Al-20Si-5Fe ALLOY WITH MELT TREATMENT AND EXTRUSION: *Y. S. Choi* [1]; J. S. Lee[1]; W. T. Kim[1]; H. Y. Ra[1]; [1]Seoul National University

10:30 AM
EFFECTS OF Mn DISPERSOID ON THE CRACK INITIATION DURING FATIGUE IN Al-Zn-Mg-Mn ALLOY: *Y. S. Woo* [1]; S. W. Nam[1]; [1]Korea Advanced Institute of Science and Technology

10:50 AM
MECHANICAL PROPERTIES OF PARTIALLY CRYSTALLIZED AMORPHOUS ALLOYS: *H. S. Kim* [1]; P. J. Warren[1]; H. R. Lee[1]; C. W. Won[1]; S. S. Cho[1]; B. S. Chun[1]; [1]Chungam National University, Dept. of Met. Eng. & RASOM ERC, Taejon 305-764 Korea

11:10 AM
TEXTURE INVESTIGATION OF DEEP DRAWN OF Al CuP BY ACOM AND X-RAY MEASUREMENT: *N. J. Park*[1]; F. Springer[1]; [1]Korea National University of Technology, Korea

Materials for Microelectronics and Electronic Packaging: Session I

Wednesday AM Room: Honolulu Suite I
July 15, 1998 Location: Tapa Towers

Session Chairs: Nirmal Sharma, Singapore Technologies, Milpitas, CA 95035, USA; Nanxian Chen, University of Science and Technology, Beijing China

8:30 AM
CURRENT TRANSPORT MECHANISMS THROUGH p-ZnSe/METALS INTERFACES WITH INTERMEDIATE SEMICONDUCTOR LAYERS: *Y. Koide* [1]; T. Kagawa[1]; T. Oku[1]; H. Mori[1]; Masanori Murakami[1]; N. Teraguchi[2]; Y. Tomomura[2]; A. Suzuki[2]; [1]Kyoto University, Department of Materials Science and Engineering, Sakyo-ku, Kyoto 606-01 Japan; [2]Sharp Corporation, Central Research Laboratories, Ichinomoto-cho, Tenri, Nara 632 Japan

8:50 AM
STUDY ON THE INCREASE OF WAFER BONDING CONTACT AREA BY LINEAR HEAT TREATMENT: *Jin Woo Lee* [1]; Choon Sik Kang[1]; [1]Seoul National University, Division of Materials Science & Engineering, Seoul Korea

9:10 AM
ELECTRICAL PROPERTIES AT p-ZnSe/METAL INTERFACES OF ANNEALED CONTACTS : *T. Kawakami* [1]; Y. Koide[1]; Masanori Murakami[1]; N. Teraguchi[2]; Y. Tomomura[2]; A. Suzuki[2]; [1]Kyoto University, Department of Materials Science and Engineering, Sakyo-ku, Kyoto 632 Japan; [2]Sharp Corporation, Central Research Laboratories, Ichinomoto-cho, Tenri, Nara 632 Japan

9:30 AM
APPLICATION OF In_{x}-Ga_{1-x} As BASED OHMIC CONTACTS OF p-TYPE GaAs: *Mitsumasa Ogura* [1]; Hidetsugu Mori[1]; Masanori Murakami[1]; Mitsuhiro Nakamura[2]; Masaru Wada[2]; [1]Kyoto University, Division of Material Science and Engineering, Graduate School of Engineering, Kyoto 606-01 Japan; [2]Sony Corporation, Semiconductor Company, Atsugi Technology Center, 4-14-1 Asahi-cho, Atsugi-shi, Knagawa 243 Japan

9:50 AM INVITED PAPER
EFFECT OF WATER CHEMISORPTION ON Al-Si-Cu/Ti/TiN/Ti INTERCONNECTS: *Y. Taga*[1]; T. Ohwaki[1]; T. Yosida[1]; [1]Toyota Central Research and Development Labs, Nagakute, Aichi 40-11 Japan

10:10 AM
CORRELATION BETWEEN RESISTIVITY AND COLUMNAR STRUCTURE IN TITANIUM FILMS: *Tetsu Miyoshi* [1]; Yumiko Haga[1]; Osamu Nittono[1]; [1]Tokyo Institute of Technology, Department of Metallurgical Engineering, 2-12-1 Oh-okayama, Meguro-ku, Tokyo 152 Japan

10:30 AM
MICROSTRUCTURE OF POROUS TITANIUM DIOXIDE FILMS PREPARED BY AIR-OXIDIZING PURE TITANIUM FILMS: *Tadao Kaneko* [1]; Osamu Nittono[2]; [1]Gunma College of Technology, 580 Toribacho, Mae-bashi-shi, Gunma 371-0845 Japan; [2]Tokyo Institute of Technology, Department of Metallurgical Engineering, 2-12-1 Oh-okayama, Meguroku, Tokyo 152 Japan

10:50 AM
MATERIAL CHARACTERIZATION OF DISPERSION HARDENED PLATINUM: *Bernd F isc her* [1]; Dietmar Freund[1]; Andreas Behrends[1]; David Lupton[2]; Jurgen Merker[2]; [1]Fachhochschule Jena - University of Applied Science, Department of Materials Technology, Jena D-07745 Germany; [2]W. C. Hera ens Gambh, Materials Technology Division, Hanau, Germany

Melt Processing and Casting: Session I

Wednesday AM Room: Iolani Suite V
July 15, 1998 Location: Tapa Towers

Session Chairs: K. Miwai, Japan; R. Abbaschian, University of Florida, Department of Materials Science & Engineering, Gainesville, FL 32603, USA

8:30 AM INVITED PAPER
APPLICATION OF THE ACCELERATED CRUCIBLE ROTATION TECH. IN THE DIRECTIONAL SOLIDIFICATION OF Al-Cu EUTECTIC: *Wanqi Jie* [1]; [1]Northwestern Polytechnical University, Xi'ao, China

8:50 AM
MICRO-MACRO MODELING OF SOLIDIFICATION MICROSTRUCTURES IN FINITE-ELEMENT SIMULATIONS: *S. P. Mar sh* [1]; [1]Naval Research Laboratory, Washington, DC 20375-5343 USA

9:10 AM
FUNDAMENTALS OF COUNTER GRAVITY CASTING: *Scott R. Giese* [1]; [1]University of Northern Iowa, Metal Casting Center USA

9:30 AM
FORMATION OF SURFACE BLEEDS IN TWIN ROLL CAST ALUMINIUM SHEET: *Ming Yun* [1]; J. D. Hunt[1]; S. A. Lockyer[1]; [1]University of Oxford, Department of Materials, Parks Road, Oxford, England UK

9:50 AM
MODELING THE DEEP BED FILTRATION OF ALUMINUM: *Rung T. Bui* [1]; Duygu Kocaefe[1]; Laszlo Kiss[1]; [1]Universite du Quebec a Chicoutimi, Chicoutimi, Quebec G7H 2B1 Canada

10:10 AM
STUDY ON SEEDING TECHNOLOGY FOR PROTECTION OF SINGLE CRYSTAL CASTING: *Zhoughui Gui* [1]; [1]Institute of Aeronautical Materials, China

10:30 AM
A MATHEMATICAL MODEL FOR SIMULATING THE PUDDLE FORMATION IN THE SINGLE ROLL RAPID SOLIDIFICATION PROCESS FOR PRODUCING METALLIC THIN STRIPS: *Ching Wen Chen* [1]; Jer Haur Kuo[1]; Weng Sing Hwang[1]; [1]National Cheng Kung University, Department of Materials Science and Engineering, Tainan, Taiwan R.O.C.

10:50 AM
A NUMERICAL SIMULATION FOR THE INITIAL FILLING IN CONTINUOUS CASTING TUNDISH AND ITS EXPERIMENTAL VERIFICATION: *Li-Chuan Lin* [1]; Shyi-Ming Pan[1]; Weng-Sing Hwang[1]; [1]National Cheng Kung University, Department of Materials Science and Engineering, Tainan, Taiwan R.O.C.

11:10 AM
PURIFICATION OF LEACHED METALLURGICAL GRADE SILICON BY ELECTRON BEAM MELTING: *A. F. B. Braga*[1]; J. Otubo[1]; P. R. Mei[1]; [1]State University of Campinas, Dept. of Materials Engineering, Campinas, S. P. Brazil

11:30 AM
A STUDY OF SOFT CONTACT ELECTROMAGNETIC CASTING TECHNOLOGY: *Hoyoung Kim* [1]; J. D. Park[1]; D. J. Sim[1]; H. T. Jung[1]; H. G. Lee[1]; [1]RIST, P.O. Box 135, Pohang 790-600 Korea

Phase Transformations and Their Applications: Session IV

Wednesday AM Room: Tapa Ballroom II
July 15, 1998 Location: Tapa Towers

Session Chairs: C. S. Pande, Naval Research Lab, Washington, DC, USA; Ze Zhang, Chinese Academy of Sciences, China

8:30 AM INVITED PAPER
PHASE TRANSFORMATION AND MECHANICAL BEHAVIOUR OF Ti-6Al-4V AND GRADE 21S TITANIUM ALLOYS: *W. Sha* [1]; D. P. Savage[1]; [1]The Queen's University of Belfast, Department of Civil Engineering, Belfast, BT7 1NN UK

8:50 AM INVITED PAPER
ANOMALIES OF ELECTRICAL RESISTIVITY STUDIED BY CVM AND PPM: *Tetsuo Mohri* [1]; [1]Hokkaido University, Division of Materials Science and Engineering, Kita-13 Nishi-8, Kita-ku Sapporo 060 Japan

9:10 AM INVITED PAPER
MORPHOLOGICAL EVOLUATION OF COHERENT PRECIPITATES IN THREE DIMENTIONS: *Jong K. Lee* [1]; [1]Michigan Technological University, Department of Metallurgical and Materials Engineering, 1400 Townsend Drive, Houston, MI 49931-1295 USA

9:30 AM
MOTION OF PHASE BOUNDARIES BY SURFACE DIFFUSION: *Yoshikazu Gig a*[1]; Kazuo Ito[1]; [1]Hokkado University, Department of Mathematics, Sapporo Japan

9:50 AM
EFFECT OF EXTERNAL FIELD ON THE ORDERING OF EQUIATOMIC FePd: *T. Ic hitsubo* [1]; M. Nakamoto[1]; K. Tanaka[1]; M. Koiwa[1]; [1]Kyoto University, Dept. Materials Sci. & Eng., Kyoto 606-01 Japan

10:10 AM
HARDENING OF NiAl ALLOYS BY POINT DEFECTS AND IRON SOLUTES: *L. M. Pike* [1]; C. T. Liu[2]; Y. A. Chang[1]; [1]University of Wisconsin, Department of Materials Science and Engineering, Madison, WI 53706-1595 USA; [2]Oak Ridge National Laboratory, Metals and Ceramics Division, Oak Ridge, TN 37831-6115 USA

10:30 AM
PHENOMENA ON THE SURFACE AND ALONG A CRACK PATH IN A SUPERALLOY TUBE DURING HIGH TEMPERATURE SERVICE: *A. A. Kaya* [1]; P. Krauklis[1]; [1]The University of New South Wales, School of Materials Science and Engineering, Sydney 2052 Australia

10:50 AM
SURFACE TREATMENT OF Ni-BASED ALLOYS FOR HIGH TEMPERATURE OXIDATION PERFORMANCE: *F. Czerwinski* [1]; J. A. Szpunar[1]; [1]McGill University, Department of Metallurgical Engineering, Montreal H3A 2B2 Canada

11:10 AM
EQUIPMENT FOR ON-LINE TEXTURE MEASUREMENT AND PLASTICITY PREDICTION: *P. Blandford*[1]; J. A. Szpunar[1]; [1]McGill University, Department of Metallurgical Engineering, Montreal Canada

Solid Materials Processing and Mechanical Behavior: Session II

Wednesday AM — Room: Tapa Ballroom III
July 15, 1998 — Location: Tapa Towers

Session Chairs: J. C. M. Li, University of Rochester, Rochester, NY 14627, USA ; S. Marsh, Naval Research Lab, Washington, DC 20375-5343, USA

8:30 AM INVITED PAPER
ADVANCED MATERIALS FOR THE ENERGY & TRANSPORTATION INDUSTRIES IN THE EUROPE THE 21st CENTURY - PART 1: *M. Van de Voorde* [1]; [1]Joint Research Center, P.O. Box 2, 1755 2G Petten The Netherlands

8:50 AM
ADVANCED MATERIALS FOR THE ENERGY & TRANSPORTATION INDUSTRIES IN THE EUROPE THE 21st CENTURY - PART 2

9:10 AM INVITED PAPER
RECENT PROGRESS IN THE MODELING OF MATERIALS AND PROCESSING FOR OPTIMAL PROPERTIES: *Yiyi Li* [1]; [1]Chinese Academy of Science, Institute of Metal Research

9:30 AM INVITED PAPER
STUDIES ON THE Ta-Si-N BARRIER USED FOR Cu INTERCONNECTION: *Y. H. Shin* [1]; J. C. Kim[1]; C. Lee[1]; [1]Inha University

9:50 AM INVITED PAPER
DOUBLE GLOW SURFACE ALLOYING PROCESS: *Zhong Xu* [1]; [1]Taiyuan University of Technology

10:10 AM
THE DEVELOPMENT OF COLD-ROOTING TEXTURE IN CuZn ORDERED ALLOY: *G. Zhu* [1]; [1]University of Science and Technology, Beijing China

10:30 AM
THE EFFECT OF BORON ON THE MECHANICAL BEHAVIORS OF AN Ni-19Si-3Nb BASED ALLOY: *Jason S. C. Jang* [1]; S. K. Wong[1]; C. H. Tsau[2]; [1]Shou University, Dept. of Materials Science and Engineering, Kaohsiung, Taiwan ROC; [2]Materials Research Laboratories, ITRI, Hsinchu, Taiwan ROC

10:50 AM
RHEAOLOGIC THERMAL FRACTURE OF MATERIALS WITH DEFECTS INDUCED BY LASER BEAM THERMAL SHOCK: *Y. C. Zhou* [1]; [1]Xiangtan University, China

Welding & Laser Processing: Session I

Wednesday AM — Room: Iolani Suite III
July 15, 1998 — Location: Tapa Towers

Session Chairs: D. Olson, Colorado School of Mines, Center for Welding, Golden, CO 80401, USA; P. Rodriguez, Indira Gandhi Center for Atomic Research, Kalpakkam 603-102, India

8:30 AM INVITED PAPER
LASER MATERIAL PROCESSING: RECENT ADVANCES AND THEIR IMPACT ON THE FUTURE - PART 1: *J. Thomas Schriempf* [1]; [1]Penn State University, Applied Research Laboratory, P.O. Box 30, University Park, PA 16804 USA

8:50 AM
LASER MATERIAL PROCESSING: RECENT ADVANCES AND THEIR IMPACT ON THE FUTURE - PART 2

9:10 AM INVITED PAPER
SOLIDIFICATION BEHAVIOR AND MICROSTRUCTURE EVOLUTION DURING LASER BEAM-MATERIAL INTERACTION: *P. S. Mohanty* [1]; J. Mazumder[1]; [1]University of Michigan, Center for Laser Aided Intelligent Manufacturing, Ann Arbor, MI 48109-2125 USA

9:30 AM INVITED PAPER
LASER CLADDING OF COPPER-BASED COMPOSITES ON 6061 ALUMINUM ALLOY: *Y. P. Hu* [1]; C. W. Chen[1]; K. Mukherjee[1]; [1]Michigan State University, High Energy Laser Processing Laboratory, Department of Materials Science and Mechanics, East Lansing, MI 48824 USA

9:50 AM
LOCAL MECHANICAL PROPERTIES OF STEEL WELDMENTS: *David A. LaVan* [1]; Gregory M. Shoukas[2]; William N. Sharpe[1]; [1]Johns Hopkins University, Department of Mechanical Engineering, 122 Latrobe Hall, 3400 North Charles Street, Baltimore, MD 21218 USA; [2]Lehigh University, Department of Mechanical Engineering, Bethlehem, PA 18015 USA

10:10 AM
NANOPARTICLES SYNTHESIS BY A NOVEL LASER-LIQUID INTERACTION TECHNIQUE: *T. Dobbins* [1]; D. Poondi[1]; Jogender Singh[1]; [1]The Pennsylvania State University, Department of Materials Science and Engineering, Applied Research Laboratory, University Park, PA 16804 USA

10:30 AM
XeCl EXCIMER LASER ANNEALING EFFECTS FOR a-Si/a-SiN DOUBLE ACTIVE LAYER: *C. -M. Park*[1]; J. -S. Yoo[1]; J. -H. Jeon[1]; M. -K. Han[1]; [1]Seoul National University, School of Electrical Engineering, Seoul 151-742 Korea

10:50 AM
FEMTOSECOND LASER: A NEXT GENERATION TOOL FOR PROCESSING OF MATERIALS: *A. P. Malshe* [1]; A. M. Ozkan[2]; P. A. Mollian[3]; A. Mushondt[1]; W. D. Brown[1]; [1]University of Arkansas, Materials and Manufacturing Research Laboratory (MRL), Department of Mechanical Engineering, Fayetteville, AR 72701 USA; [2]University of Arkansas, High Density Electronics Center (HiDEC), Department of Engineering; [3]University of Iowa, Department of Mechanical Engineering, Ames, IO

WEDNESDAY PM

Advanced Ferrous Alloys: Session III

Wednesday PM Room: Iolani Suite VI
July 15, 1998 Location: Tapa Towers

Session Chairs: J. J. DeLoach, Naval Surface Warfare Center, Carderock Division Code 615, West Bethesda, MD 20817-5700 USA; K. Ameyama, Ritumeikan University, Japan

7:00 PM INVITED PAPER
HIGH QUALITY THIN SLAB CASTING TECHNOLOGY FOR HOT STRIP PRODUCTION: *Tadao Watana be* [1]; Sei Hiraki[1]; Masayuki Kawamoto[1]; Toshihiko Murakami[1]; [1]Corporate R&D Laboratories Sumitomo Metal Ind. Ltd., Steelmaking Process Research Department, 16-1 Sunayama, Hasaki, Kashima-gun, Ibaraki 314-02 Japan

7:20 PM
HIGH STRENGTH NICKEL-FREE DUPLEX STAINLESS STEELS FOR STRUCTURAL ENGINEERING APPLICATIONS: *Jun Wang* [1]; M. O. Speidel[1]; P. J. Uggowitzer[1]; [1]Institute of Metallurgy, ETH-Zentrum, Zurich CH-8092 Switzerland

7:40 PM
MECHANICAL PROPERTIES OF STRUCTURAL AND FIRE-RESISTANT STEELS AT HIGH TEMPERATURE: *W. Sha* [1]; F. S. Kelly[1]; P. N. Cawley[1]; P. J. Blair[1]; [1]The Queen's University of Belfast, Department of Civil Engineering, Belfast BT7 1NN UK

8:00 PM
IMPROVING PROPERTY OF 0.5% CARBON MICROALLOYED STEEL FOR HOT FORGING USING INTRAGRANULAR FERRITO: *Yin Jiang* [1]; [1]Shanghai No. 5 Steel (Group) Co. Ltd., China

8:20 PM
ND STEEL-HIGH RESISTANCE TO SULFUR DEWPOINT CORROSION: *Zheng Wenlong* [1]; Wang Rongguang[1]; [1]Shanghai Research Institute of Materials, Shanghai P. R. China

8:40 PM
DESIGN OF A NEW HIGH STRENGTH LOW ALLOY STEEL BY THE KEY POINT METHOD: *Zhenbo Zhao* [1]; Derek O. Northwood[1]; Cheng Liu[2]; Wang Dezun[2]; [1]University of Windsor, Mechanical & Materials Engineering, Windsor, Ontario N9B 3P4 USA; [2]Harbin Institute of Technology, Department of Materials Science & Engineering, Harbin, P.R. China

9:00 PM
INVESTIGATION ON THE PRECIPITATION OF CARBONITRIDE AND COPPER IN A HIGH STRENGTH LOW ALLOY (HSLA) STEEL: *S. Rang anathan* [1]; [1]National Metallurgical Laboratory, Jamshedpur 831-007 India

9:20 PM
PREDICTION OF THE CARBO-NITRIDE PRECIPITATION IN HIGH STRENGTH LOW ALLOY (HSLA) STEELS BY THE TECHNIQUE OF SUCCESSIVE PARTIAL EQUILIB: *S. Rang anathan* [1]; [1]National Metallurgical Laboratory, Jamshedpur 831-007 India

9:40 PM
HYDROGEN INDUCED CRACKING OF HSLA-100 STEELS IN SEAWATER UNDER POTENTIOSTATIC CONDITIONS: *Kumkum Banerjee* [1]; U. K. Chatterjee[1]; [1]Indian Institute of Technology, Department of Metallurgical & Materials Engineering, Kharagpur 721302 India

Composite Materials: Session V

Wednesday PM Room: Honolulu Suite II
July 15, 1998 Location: Tapa Towers

Session Chairs: O. T. Inal, New Mexico Tech., Materials and Metallurgical Engineering Department, Socorro, NM 87801, USA; Kyung Sub Lee, Hanyang University, Seoul, Korea

7:00 PM INVITED PAPER
INTERFACES IN COATED GRAPHITE/MAGNESIUM COMPOSITES: *Jing Zhu* [1]; [1]Tsinghua University, China

7:20 PM
KINETICS OF METAL ORGANIC CHEMICAL VAPOUR INFILTRATION AND MICROSTRUCTURES OF AMORPHOUS AND NANO-CRYSTALLINE ZrO_2 INCORPORATED INTO PARTIALLY SINTEARED $MoSi_2$ MATRIX: *Noboru Yoshikaw a* [1]; Shoji Taniguchi[1]; Atsushi Kikuchi[1]; [1]Tohoku University, School of Metallurgy, Division of Engineering, Graduate Schools, Aoba-ku, Sendai, Miyagi Japan

7:40 PM
MATERIALS CHARACTERIZATION OF POLYPROPYLENE/Tin AND POLYPROPYLENE/ALUMINUM MECHANICAL ALLOY: *W. J.D. Shaw* [1]; M. A. Fraser[1]; [1]University of Calgary, Department of Mechanical Engineering, Calgary, Alberta Canada

8:00 PM
FIRST-PRINCIPLES CALCULATIONS OF INTERFACES IN MATERIALS: GRAIN BOUNDARIES IN SiC AND SiC/METAL INTERFACES: *Masanori K oh yama* [1]; John Hoekstra[1]; [1]Osaka National Research Institute, Department of Material Physics, Agency of Industrial Science and Technology, 1-8-31 Midorigaoka, Ikeda, Osaka 563 Japan

8:20 PM
CHARACTERIZATION OF CREEP CRACKING IN CARBON FIBER/EPOXY COMPOSITE: *S. Y. Zhang* [1]; [1]Chinese Academy of Sciences, Institute of Mechanics, Beijing 100080 China

8:40 PM
THE INFLUENCE OF MICROSTRUCTURAL DAMAGE ON THE THERMAL PROPERTIES OF CMC's: *K. R. McDonald* [1]; F. W. Zok[1]; J. R. Dryden[2]; A. Majumdar[3]; [1]University of California, Materials Department, Santa Barbara, CA 93106 USA; [2]University of Western Ontario, Department of Mechanical and Materials Engineering, London, Ontario Canada; [3]University of California, Mechanical Engineering Department, Berkeley, CA 94720 USA

9:00 PM
ROLE OF REINFORCEMENTS ON THE CREEP BEHAVIOR OF Al-SiC COMPOSITES: *Kamal J anghorban* [1]; [1]Shiraz University, Department of Materials Science and Engineering, Shiraz Iran

9:20 PM
MODELLING OF ELECTRICAL DISCHARGE MACHINING FOR CERAMIC COMPOSITES: *Constantin Opran* [1]; [1]Politechnica University of Bucharest

General Abstracts: Session IV

Wednesday PM Room: Iolani Suite I
July 15, 1998 Location: Tapa Towers

Session Chairs: M. A. Otooni, USA Science and Technology Center-Far East, Japan; Ildong Choi, Korea Maritime University, Korea

7:00 PM
STRENGTHENING MECHANISM OF Al MATRIX COMPOSITES REINFORCED BY SHAPE MEMORY ALLOY: *Gyu Chang Lee* [1]; Young Chul Park[2]; [1]Research Institute of Industrial Science and Technology (RIST), #32 Hyoja-Dong, Nam-Ku, Pohang City, Kyungbuk 790-330 Korea; [2]Dong-A University, Department of Mechanical Engineering, Pusan Korea

7:20 PM
MICROSTRUCTURE AND MECHANICAL PROPERTIES OF Al/TiNi$_p$ SHAPE MEMORY COMPOSITES FABRICATED BY POWDER METALLURGY: *Changhun Han* [1]; Busob Kim[1]; Ildong Choi[2]; Ikmin Park[1]; Kyongmox Cho[1]; Deukman An[3]; [1]Pusan National University, Dept. of Metall. Eng., Pusan 609-735 Korea; [2]Korea Maritime University, Dept. of Mat. Engineering, Pusan 606-791 Korea; [3]Pusan National University, Dept. of Mech. and Product Eng., Pussan 609-735 Korea

7:40 PM
EXPOSURE EXPERIMENT ANALYSIS OF AUTOMOTIVE STEEL SHEET COMBINATION SPECIMENS SUBJECTED TO FOUR KINDS OF CLIMATES: *Xinling Li* [1]; [1]Manufacture Tech. Ins. Dongfeng Motor Corp.

8:00 PM
AUSTEMPERING TEMPERATURE - MECHANICAL PROPERTY RELATIONSHIP IN UNALLOYED DUCTILE IRON AUSTEMPERED IN THE TEMPERATURE RANGE 325ºC - 375ºC: *J. Zimba* [1]; D. J. Simba[1]; E. Navara[1]; O. S. Chinyamakobru[1]; [1]University of Zimbabwe, Met. Eng. Dept., P.O. Box MP167, Mount Pleasant, Harare Zimbabwe

8:20 PM
THE STUDY ON THE CYCLE LIFETIME OF Mn/Ni/Co,Mn/Al COMPOUND AND Ni-MH BATTERY: *J. Wu*[1]; [1]Central Iron and Steel Research Inst., China

8:40 PM
DIFFUSION BARRIER PROPERTY OF TiC BETWEEN Si AND Cu: *Hidetsugu Mori* [1]; Takeshi Okada[1]; Masanori Murakami[1]; [1]Kyoto University, Division of Material Science and Engineering, Graduate School of Engineering, Kyoto 606-01 Japan

9:00 PM
CERAMIC ELECTROSTATIC CHUCKS MADE BY SLIP-CASTING AND FIRING ON METAL SUBSTRATES: *Guo Quan Lu* [1]; [1]Virginia Polytechnic Institute and State University, Department of Materials Science and Engineering and the Bradley Department of Electrical and Computer Engineering, Blacksburg, VA 24061 USA

9:20 PM
TANTALUM SILICIDE SPUTTERING TARGET MATERIAL FOR AMORPHOUS Ta-Si-N DIFFUSION BARRIER FOR Cu METALLIZATION : *Eugene Y Ivanov*[1]; [1]Tosoh SMD Inc., R&D Advanced Materials Group, 3600 Gantz Rd., Grove City, OH 43213 USA

9:40 PM
ELECTRICAL AND FATIGUE FAILURE PROPERTIES OF PLASTIC BALL GRID ARRAY ASSEMBLIES-EFFECT OF THERMAL SHOCK: Q. H. Tang[1]; Y. C. Chan[1]; C. M.L. Wu[1]; J. K.L. Lai[1]; [1]City University of Hong Kong, Department of Electronic Engineering, Department of Physics and Materials Science, Tat Chee Avenue Kowlno, Hong Kong China

Hydrogen Absorbing Materials: Session I

Wednesday PM Room: Tapa Ballroom III
July 15, 1998 Location: Tapa Towers

Session Chairs: G. Sandrock, Suna Tech Inc., Ringwood, NJ 07456, USA; Chongyu Wang, China

7:00 PM INVITED PAPER
A STUDY ON THE DEVELOPMENT OF OVER-STOICHIOMETRIC Zr-Ti-Mn-V-Ni HYDROGEN STORAGE ALLOY WITH HIGH CAPACITY AND HIGH RATE CAPABILITY FOR Ni-MH RECHARGEABLE BATTERY: *Dong-Myung Kim* [1]; Jai-Young Lee[1]; [1]Korea Advanced Institute of Science and Technology, Department of Materials Science and Engineering, 373-1 Kusong-dong, Yusong-gu, Taejon Korea

7:20 PM INVITED PAPER
STATE-OF-THE-ART OF HYDROGEN STORAGE IN REVERSIBLE METAL HYDRIDES: *G. Sandrock*[1]; M. A. Imam[2]; [1]Suna Tech, Inc., 113 Kraft Place, Ringwood, NJ 07456 USA; [2]Naval Research Laboratory, Code 6320, Washington, DC 20375 USA

7:40 PM
HYDROGEN STORAGE VIA REVERSIBLE CYCLOAKANE DEHYDROGENATION CATALYZED BY A SOLUBLE IRIDIUM HYDRIDE COMPLEX: *Craig M. Jensen* [1]; Mukta Gupta[1]; Nathan Mariels[1]; Ragaiy A. Zidan[1]; Steve Guthrie[1]; Esther Pak[1]; Chrystel Hagen[1]; [1]University of Hawaii, Dept. of Chemistry, Honolulu, HI 96822 USA

8:00 PM
CATALYTIC DEHYDROGENATION OF SODIUM ALUMINUM HYDRIDES: *Ragaiy A. Zidan* [1]; Craig M. Jensen[1]; [1]University of Hawaii, Hawaii Natural Energy Institute, Honolulu, HI 96822 USA

8:20 PM
CRYSTAL STRUCTURE AND HYDROGEN ABSORPTION PROPERTIES OF La-RICH La(Ni,M)*(x=3~5) MELT-SPUN RIBBONS: *M. Okada* [1]; T. Kuriiwa[1]; T. Tamura[1]; H. Takamura[1]; H. Nakamura[1]; [1]Tohoku University, Department of Materials Science, Graduate School of Engineering, Sendai 980-77 Japan

8:40 PM
HYDROGEN INTERACTION WITH QUISICRYSTALLINE ZrCuNiAl ALLOY: *N. Eliaz* [1]; D. Eliezer[1]; D. Zander[1]; U. Koster[1]; [1]Ben-Gurion University of the Nagev, Dept. of Materials Eng., P.O. Box 653, Beer Sheva 84105 Israel

9:00 PM
GAS DIFFUSION IN SINGLE CRYSTAL OXIDES: *James E. Shelby* [1]; [1]Alfred University, NYS College of Ceramics, Alfred, NY 14802 USA

9:20 PM
EFFECT OF PROCESSING PARAMETERS ON THE STRUCTURE, MORPHOLOGY AND HYDROGEN STORAGE PROPERTIES OF Mg-BASED MULTI-COMPONENT ALLOYS: *Krishna Sapru* [1]; L. Ming[1]; J. Evans[1]; N. T. Stetson[1]; [1]Energy Conversion Devices, Inc., 1675 West Maple Road, Troy, MI 48084 USA

9:40 PM
EFFECT OF Cr ADDITION ON THE CYCLE LIFE OF Ti-BASED ALLOY ELECTRODES FOR Ni/MH RECHARGEABLE BATTERY: *Ji-Sang Yu*[1]; Ho Lee[1]; Kuk-Jin Jang[1]; Jai-Young Lee[1]; [1]Korea Advanced Institute of Science and Technology, Department of Materials Science and Engineering, 373-1 Kusong-dong, Yusong-gu, Taejon 305-701 South Korea

Light Metals: Session V

Wednesday PM Room: Honolulu Suite III
July 15, 1998 Location: Tapa Towers

Session Chairs: Fanxiu Lu, China; Min-Koo Han, Seoul National University, Korea

7:00 PM
PROCESS PLANNING FOR LAYERED MANUFACTURING USING HETEROGENEOUS CAD MODELS: *Debasish Dutta* [1]; Vinod Kumar[1]; [1]University of Michigan, Mechanical Engineering Dept, 2250 G G Brown Labs, Ann Arbor, MI 48109-2125

7:20 PM
CALORIMETRIC STUDY OF PRECIPITATION KINETICS IN Al-Mg-Si-X(Cr,Be) ALLOY: *Kee-Do Woo* [1]; Jong-Soo Lee[2]; Jin-Ho Jeong[2]; Dong-Keon Kim[1]; Sug-Wong Kim[1]; [1]Chonbuk National University (RIAMD), Faculty of Advanced Materials Engineering, Chonbuk 560-756 Korea; [2]Chonbuk National University, Department of Metallurgical Engineering, Chonbuk 560-756 Korea

7:40 PM
ON SILICON PHASE IN Al-Mg_2Si ALLOYS WITH EXCESS SILICON: *A. D. Shan* [1]; I. G. Moon[2]; J. E. Yoo[3]; H. S. Kim[2]; J. Y. Chang[2]; H. S. Ko[2]; J. W. Park[2]; [1]Shanghai Jiao Tong University, Department of Mater. Sci., Shanghai 200030 P.R.China; [2]Korea Institute of Science and Technology, Division of Metals, P.O. Box 131, Cheongryang, Seoul 130-650 Korea; [3]Iljin Corporation, Metals Lab., Dowha, Mapo, Seoul 121-040 Korea

8:00 PM
REFINEMENT OF SECOND PHASE IN Al-Ti BASE ALLOYS BY REPEATED WORKING: *Atsuki Kurihara*[1]; Goroh Itoh[1]; [1]Nagaoka University of Technology, Kami-Toioka, Nagaoka, Niigata-pref 94021 Japan

8:20 PM
EFFECTS OF T4 AND T6 TEMPERS ON POST SEMI-SOLID FORMED 319 ALUMINUM ALLOY: *E. Cerri* [1]; E. Evangelista[1]; S. Spigarelli[1]; S. Paddon[2]; [1]Ancona University, Mechanical Dept., via Brecce Bianche, Ancona 60131 Italy; [2]O. S. U., Mechanical Eng. Dept., Carvallis, OR USA

8:40 PM
ELECTRON BEAM SURFACE PROCESSING TO STUDY PHASE SELECTION IN 3xxx SERIES Al ALLOYS: *L. Carroll* [1]; K. A. O'Reilly[1]; B. Cantor[1]; P. V. Evans[2]; [1]University of Oxford, Oxford Centre for Advanced Materials and Composites, Department of Materials, Prks Road, Oxford OX1 3PH UK; [2]Alcan Internatinal Limited, Banbury Laboratory, Southam Road, Banbury, Oxon OX16 7SP UK

9:00 PM
THE INTERFACE PROPERTIES OF SQUEEZE CAST ALUMINIUM ALLOY A356 LOCALLY REINFORCED WTH Al2O3 SHORT FIBRE: *M. J. Fuller* [1]; B. Cantor[1]; S. Gungor[1]; M. J. Hughes[2]; [1]University of Oxford, Oxford Centre for Advanced Materials and Composites, Department of Materials, Oxford OX 3PH UK; [2]Lucas Varity Advanced Behicle Systems Development, Shirley, Solihull B90 4JJ UK

9:20 PM
EFFECT OF EXTRUSION TEMPERATURE ON THE CRYSTALLOGRAPHIC TEXTURE IN Al-Li-Cu ALLOYS: *K. V. Jata* [1]; [1]Air Force Research Laboratory/MLLM, Wright Patterson Air Force Base, OH 45433-7178 USA

Materials for Microelectronics and Electronic Packaging: Session II

Wednesday PM Room: Honolulu Suite I
July 15, 1998 Location: Tapa Towers

Session Chairs: M. Murakami, Japan; Zongguang Wang, Shanghai Jiao Tong University, China

7:00 PM INVITED PAPER
THE RELIABILITY OF METALLIC ELEMENTS IN MICROELECTRONICS: *J. W. Morris* [1]; Seung-Hyuk Kang[1]; [1]University of California, Department of Material Science, Berkeley and Center for Advanced Materials, Lawrence Berkely Laboratory, 1 Cyclotron Road, Berkeley, CA 94720 USA

7:20 PM
EFFECT OF DEFECTS ON THE MECHANICAL PROPERTIES OF Sn-Ag-Cu SOLDER JOINTS: *I. Anderson* [1]; J. Foley[1]; O. Unal[1]; [1]Ames Laboratory

7:40 PM
CHIP ON BOARD FOR MILITARY AVIONICS APPLICATIONS: *David Stark* [1]; Viswarm Puligandla[1]; Mark Staller[1]; [1]Ratheon (TI) Systems, 2501 South Highway 121, Lewisville, TX 75067 USA

8:00 PM
MECHANICAL RELIABILITY OF SOLDER INTERCONNECTS IN MULTICHIP MODULES (MCMS): *K. Linga Murty* [1]; Hong Yang[2]; Phillip Deane[3]; Iwona Turlik[4]; [1]North Carolina State University, Raleigh, NC 27695-7909 USA; [2]MCNC Electronic and Information Technologies, RTP, NC 27709-2889 USA; [3]Flip Chip Technologies, Phoenix, AZ 85034 USA; [4]Motorola, Schaumburg, IL 60196-1078 USA

8:20 PM
PROTOTYPE CIRCUIT BOARDS ASSEMBLED WITH NON-Pb-BEARING SOLDERS: *P. T. Vianco* [1]; J. A. Rcjent[1]; [1]Sandia National Laboratories, Albuquerque, NM USA

8:40 PM
MOISTURE SENSITIVITY AND RELIABILITY OF 28 LEAD TSOP: *Rao Mahidhara* [1]; Jack Belani[1]; [1]Cypress Semiconductor Corporation, M/S:2.1, 2901 North First Street, San Jose, CA 95134 USA

9:00 PM
SURFACE CONDITION OF PLASTICS FOR METALLISATION WITH HYDROGEN PEROXIDE: *Luiz A. Teixeira*[1]; [1]Catholic University of Rio de Janeiro, Dept. Materials Science and Metallurgy, CP. 38008 - Gavea, Rio de Janeiro, RJ 22453-900 Brazil

9:20 PM
CONTINUM MODELING OF SOLDER INTERCONNECTS — INFLUENCE OF GEOMETRY AND LOADING VARIATIONS TMF LIFETIME: *S. N. Burchett* [1]; M. K. Neilsen[1]; P. T. Vianco[1]; D. R. Frear[1]; [1]Sandia National Lab at Albuquerque, Albuquerque, NM 87185 USA

9:40 PM
IN-SITU COMPOSITE SOLDERS FOR IMPROVED RELIABILITY: *K. N. Subramanian* [1]; T. R. Bieler[1]; J. P. Lucas[1]; [1]Michigan State University

Phase Transformations and Their Applications: Session V

Wednesday PM Room: Tapa Ballroom II
July 15, 1998 Location: Tapa Towers

Session Chairs: K. C. Chen, Los Almos National Laboratory, Los Alamos, NM 87545, USA; M. Nemoto, Kyushu University, Department of Materials Science and Eng., Fukuoka, Japan

7:00 PM
ISOTHERMAL TRANSFORMATION OF Au-47.5at%Cd ALLOY: *X. Ren* [1]; T. Ohba[2]; S. Yamada[1]; K. Otsuka[1]; [1]University of Tsukuba, Institute of Materials Science, Tsukuba, Ibaraki 305 Japan; [2]Teikyo University, Department of Materials Science and Engineering, Utsunomiya 320 Japan

7:20 PM ABSTRACT TITLE NOT AVAILABLE

7:40 PM
ORDER-MESOSCOPIC TRANSFORMATION IN COMPOUND SEMICONDUCTOR In_2Te_3: *Satoko Abe* [1]; Eiki Inoue[1]; Yoshio Nakamura[1]; Osamu Nittono[1]; [1]Tokyo Institute of Technology, Department of Metallurgical Engineering, Oh-okayama, Meguro-ku, Tokyo 152 Japan

8:00 PM
THEORETICAL INVESTIGATION OF THE CUBIC TO TETRAGONAL TRANSITION IN ZrO_2-BASED ALLOYS: *Junji Katamura* [1]; Yuichi Ikuhara[1]; Taketo Sakuma[1]; [1]University of Tokyo, Department of Materials Science, Faculty of Engineering, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113 Japan

8:20 PM
MICROANALYSIS OF MODULATED STRUCTURE IN ZIRCONIA CERAMICS: *N. Shibata* [1]; J. Katamura[1]; Y. Ikuhara[1]; T. Sakuma[1]; [1]The University of Tokyo, Department of Science, Faculty of Engineering, 7-3-1 Gibgi, Bunkyo-ku, Tokyo 113 Japan

8:40 PM
SHORT RANGE ORDER IN Ni_4Mo STUDIED BY QUANTITATIVE HIGH RESOLUTION TRANSMISSION ELECTRON MICROSCOPY: *S. Hata* [1]; T. Mitate[1]; S. Matsumura[2]; N. Kuwano[1]; K. Oki[1]; D. Shindo[3]; [1]Kyushu University, Department of Materials Science and Technology, Kasuga 816 Japan; [2]Kyushu University, Department of Nuclear Energy; [3]Tohoku University, Institute for Advanced Materials Processing, Sendai Japan

9:00 PM
PHASE TRANSITION IN $(Nd_xSml-x)AlO_3$: STRUCTURAL BEHAVIOR CHARACTERIZED BY IONIC RADIUS AND TEMPERATURE: *Hiroyuki Horiuc hi*[1]; Akihiro Saitow[1]; Toetsu Shishido[2]; Akira Yoshikawa[2]; Tsuguo Fukuda[2]; Atsushi Inoue[3]; Tadato Mizota[3]; [1]University of Tokyo, Mineralogical Institute, Graduate School of Science, Tokyo 113 Japan; [2]Tohoku University, Institute for Materials Research, Katahira, Sendai 980 Japan; [3]Yamaguchi University, Department of Advanced Materials Science and Engineering, Yamaguchi, 753 Japan

9:20 PM
HYDROGEN EMBRITTLEMENT OF DUPLEX STAINLESS STEEL: *A. Vanono* [1]; G. Solovioff[1]; E. Abramov[1]; D. Eliezer[1]; [1]Ben-Guron University, Beer-Sheva Israel

Smart Materials and Processing: Session I

Wednesday PM Room: Iolani Suite V
July 15, 1998 Location: Tapa Towers

Session Chairs: A. Bhalla, Pennsylvania State University, 253 Materials Research Laboratory, University Park, PA 16802, USA; Lianchen Zhao, Harbin Institute of Technology, China

7:00 PM
SHAPE MEMORY EFFECTS AND MICROSTRUCTURE OF RuTa HIGH-TEMPERATURE SHAPE MEMORY: *Kanryu Inoue* [1]; Kiyoshi Mizuuchi[2]; Gabriel Wrignt[1]; Jun-Hee Lee[1]; Yo Thomota[1]; [1]University of Washington, Materials Science and Engineering, Box 35120, Seattle, WA 98195-2120 USA; [2]Osaka Municipal Technical Research Insitute, Osaka 536 Japan

7:20 PM
MICROSTRUCTURE AND MECHANICAL PROPERTIES OF TiPd-SMA FIBER/Ti MATRIX SMART COMPOSITES: *Kiyoshi Mizuuc hi*[1]; Kenichi Hamada[2]; Kanryu Inoue[3]; Minoru Taya[2]; Kazuyuki Enami[4]; Kiyoshi Yamauchi[4]; [1]Osaka Municipal Technical Research Institute, Osaka 536 Japan; [2]University of Washington, Mechanical Engineering, Seattle, WA 98195-2600 USA; [3]University of Washington, Materials Science and Engineering, Seattle, WA 98195-2120 USA; [4]Ryukoku University, Department of Mechanical and System Engineer, Otsu 520-01 Japan

7:40 PM
IN SITU OBSERVATION OF MARTENSITIC TRANSFORMATION IN SHAPE MEMORY ALLOYS: *Lijuan Sun* [1]; [1]Beijing University of Aeronautics and Astronautics, Beijing China

8:00 PM
AGING EFFECT ON STRUCTURE AND SHAPE MEMORY PROPERTY OF TiNiPd ALLOY: *Hubin Xu* [1]; [1]Beijing University of Aeronautics and Astronautics, Beijing China

8:20 PM
NiTi SHAPE MEMORY ALLOYS PRODUCED BY ELECTRON BEAM MELTING:PRELIMINARY RESULTS: *J. Otubo* [1]; P. R. Mei[1]; S. Koshimizu[2]; L. G. Martinez[2]; [1]State University of Campinas, Dept. of Materials Engineering, Campinas S.P.13083-970 Brazil; [2]IPEN/CNEN, Dept. of Engineering and Materials Science, S.Paulo S.P. 05508-900 Brazil

8:40 PM
Ni-FREE Ti-BASED SHAPE MEMORY ALLOYS AND THEIR MECHANICAL PROPERTIES: *Hiroyuki Tada* [1]; Hideki Hosoda[2]; M. Takeuchi[1]; Kenichi Hamada[3]; Kiyoshi Mizuuchi[4]; Kiyoshi Aoki[5]; Kanryu Inoue[3]; [1]Horikawa Corporation, Sabae, Fukui Japan; [2]Tohoku University, Institute of Metals Research, Sendai Japan; [3]University of Washington, Materials Science and Engineering, Box 352120, Seattle, WA 98195-2120; [4]Osaka Municipal Technical Research Institute, Osaka 536 Japan; [5]Kitami Institute of Technology, Kitami, Hokkaido Japan

9:00 PM
EFFECTS OF THERMAL CYCLING ON MARTENSITIC TRANSFORMATION TEMPERATURES IN Ti-Ni-Cu SHAPE MEMORY ALLOYS: *Tae Hyun Nam* [1]; Sung Soo Cha[1]; Gwang Soo Ha[1]; [1]Gyeong Sang National University, Department of Metallurgical and Materials Engineering, Chinju, Gyeong Nam 660-701 Korea

9:20 PM
SHAPE RECOVERY STRESS OF Ti-Ni and Ti-Ni-Cu SHAPE MEMORY ALLOYS: *Tae Hyun Nam* [1]; Gwang Soo Ha[1]; Gyu Bong Cho[1]; [1]Gyeong Sang National University, Department of Metallurgical and Materials Engineering, Chinju, Gyeong Nam 660-701 Korea

9:40 PM
EFFECTS OF PRODUCTION METHODS ON TREATING OF Ni-Ti SHAPE MEMORY ALLOYS: *F. M. J. Zar andi* [1]; R. Sharghi[1]; [1]Sharif University of Technology, Department of Metallurgical Engineering, Tehran 11365-9466 Iran

Welding & Laser Processing: Session II

Wednesday PM Room: Iolani Suite III
July 15, 1998 Location: Tapa Towers

Session Chairs: J. Mazumder, University of Michigan, Center for Laser Aided Intelligent Manuf., Ann Arbor, MI 48109-2125, USA; T. Kelly, GE Aircraft Engine Co., Cincinnati, OH 45215-6301, USA

7:00 PM INVITED PAPER
DEFORMATION BEHAVIOUR OF 7075Al/ SiCp COMPOSITE DURING MULTI-PASS DEFORMATION AT HIGH TEMPERATURES: *D. Yu*[1]; A. Razaghian[1]; H. Asanuma[2]; T. Chandra[1]; [1]Wollongong University, Department of Materials Engineering, Wollongong NSW, 2522 Australia; [2]Chiba City, Department of Mechanical Engineering, Chiba City 263 Japan

7:20 PM
THE EFFECT OF INCLUSIONS AND AUSTENITE GRAIN SIZE ON THE IMPACT OF A NEWLY DEVELOPED LOW-CARBON STEEL WELD METAL: *J. M. Blac kb urn* [1]; A. Brandemarte[1]; A. G. Fox[2]; [1]Naval Surface Warfare Center, Carderock Division, 9500 MacArthur Blvd, West Bethesda, MD 20817-5700 USA; [2]Naval Postgraduate School, Center for Materials Science and Engineering, Monterey, CA 93943 USA

7:40 PM
LASER SHOCK PROCESSING ON CVD ALUMINA COATED CARBIDE INSERTS: *Jong Kook Park* [1]; Patrick Kwon[1]; K. Muhkerjee[1]; [1]Michigan State University, Department of Materials Science and Mechanics, East Lansing, MI 48824 USA

8:00 PM
THE EFFECT OF THE SURFACE CLEANING STATE ON THE SHEAR STRENGTH FOR STEEL/EPOXY/STEEL JOINTS: *Astrid Damasco* [1]; Nelson G. Alcantara[1]; Itamar Ferreira[2]; [1]Universidade Federal de Sao Carlos, Department of Materials Engineering, Via Washington Luiz, km 235, Caixa Postal 147, Sao Carlos, SP 13565-905 Brazil; [2]Universidade Estadual de Campinas - UNICAMP, Department of Materials Engineering, Caixa Postal 6122, Caminas, SP 13083-970 Brazil

8:20 PM
THE EFFECT OF WELDING CONDITIONS ON FCAW HARDFACING ABRASION RESISTANCE: *O. S. Hernandez* [1]; N. G. Alcantara[1]; [1]Federal University of Sao Carlos, Sao Carlos Brazil

8:40 PM
RESIDUAL STRESS ELIMINATION IN NICKEL 690 ALLOYS WELDS: *Weite Wu*[1]; [1]I-Shou University, 1, Section 1, Heueh-Cheng Road, Ta-Hsu Hsiang, Kauhsiung County, Taiwan 840 R.O.C.

THURSDAY AM

General Abstracts: Session V

Thursday AM Room: Iolani Suite I
July 16, 1998 Location: Tapa Towers

Session Chairs: P. Mukhopadhyay, Advanced Center for Research Electronics, Powai 400076, Bombay; C. L. Lobley, University of London, Dept. of Materials, London E1 4NS, UK

8:30 AM
LCF BEHAVIOR OF A NEW TYPE ON DS SUPERALLOY AT INTERMEDIATE TEMPERATURE: *Jianting Guo* [1]; Liao Ebin[1]; [1]Institute of Metal Research

8:50 AM
A NEW ALLOY DESIGN METHOD FOR NICKEL-BASE SINGLE CRYSTAL SUPERALLOYS: *Z. Q. Chen* [1]; Y. F. Han[1]; Z. G. Zhong[1]; P. Y. Wei[1]; M. G. Yan[1]; [1]Beijing Institute of Aeronautical Research

9:10 AM
ROLE OF Mn DISPERSOID ON THE LOW CYCLE FATIGUE AND HIGH CYCLE FATIGUE IN WELDABLE HIGH STRENGTH Al-Zn-Mg-Mn ALLOY: *D. H. Lee* [1]; [1]Korea Advanced Institute of Science and Technology

9:30 AM
A MOSSBAUER SPECTROSCOPIC STUDY ON THE MECH. ALLOYED Fe-B AMORPHOUS AND NANOCRYSTALLINE ALLOYS: *Q. S. Li* [1]; [1]Guangdon University of Technology, China

9:50 AM INVITED PAPER
OBSERVATIONS ON THE INSTABILITIES OF THICK DIAMOND FILM GROWTH BY HIGH POWER DC ARC PLASMA JET: *Fanxin Lul* [1]; [1]University of Science and Technology, Beijing China

10:10 AM INVITED PAPER
LOW TEMPERATURE CVD TECHNIQUE FOR DIAMOND : *Akio Hiraki*[1]; [1]Kochi University of Technology and Osaka University, Japan

10:30 AM INVITED PAPER
PLANARIZATION OF CVD DIAMOND FILMS BY REACTION WITH IRON BASED ALLOYS AT HIGH TEMPERATURES: *J. D. Ayer s*[1]; J. Lee[1]; K. P. Cooper[1]; H. N. Jones[1]; J. E. Butler[1]; [1]Agency for Defence Development Korea

10:50 AM
EFFECT OF PRESSURE ON THE QUALITY OF DIAMOND FILMS PREPARED BY DC ARC PLASMA JET METHOD: *G. F. Zhoug* [1]; [1]University of Science and Technology, Beijing China

11:10 AM
FORMATION OF THE DIAMOND THIN FILMS FOR THE SOD STRUCTURE: *You-Seong Lee* [1]; Kae-Myoung Lee[1]; Kwang-Man Lee[1]; Jaeong-Dae Ko[1]; Chi-Kyu Choi[1]; Young-Joon Baik[2]; [1]Cheju National University, Dept. of Physics, Ara 1-Dong, Cheju 690-756 Korea; [2]Korea Institute of Science & Technology, Division of Ceramics, Cheongryang, Seoul 130-650 Korea

Intermetallics: Session IV

Thursday AM Room: Tapa Ballroom III
July 16, 1998 Location: Tapa Towers

Session Chairs: P. I. Ferreira, Institute de Pesquisas, Energeticas e Nucleares, Sao Paulo-SP 05587-020, Brazil; Zuging Sun, University of Science & Technology, Department of Materials Science & Engineering, Beijing, China

8:30 AM
MICROSTRUCTURE AND DUCTILITY OF MULTI-PHASE INTERMETALLIC ALLOYS IN THE Ni-Si-Ti SYSTEM: *Nob uaki Sekido* [1]; Seiji Miura[2]; Yoshinao Mishima[1]; [1]Tokyo Institute of Technology, Nagatsuta, Midori-ku, Yokohama 226 Japan; [2]Hokkaido University, Division of Materials Science and Engineering, 13N8W, Kita-ku, Sapporo 060 Japan

8:50 AM
SUPERPLASTICITY IN MONOLITHIC INTERMETALLICS: *W. Y. Kim* [1]; S. Watanabe[1]; S. Hanada[1]; T. Sakai[1]; [1]Tohoku University, Institute for Materials Research, Sendai 980-77 Japan

9:10 AM
HIGH PRESSURE RAMAN AND X-RAY DIFFRACTION INVESTIGATIONS OF THE HIGH PRESSURE PHASES OF SPIN-PEI COMPOUND $CuGeO_3$: *A. Jayaraman* [1]; S. K. Sharma[1]; L. C. Ming[1]; [1]University of Hawaii, Hawaii Institute of Geophysics and Planetology, 2525 Correa Road, Honolulu, HI 96822 USA

9:30 AM
GRAIN GROWTH MECHANISM OF TUNSTEN CARBIDE DURING LIQUID PHASE SINTERING: *H. S. Ryoo* [1]; S. K. Hwang[1]; [1]Inha University, Dept. of Metallurgical Eng., 253 Younghyun-Dong, Nam-Ku, Inchon 402-751 Korea

9:50 AM
EFFECTS OF SUPERHEAT AND GROWTH RATE ON THE CRYSTAL GROWTH BEHAVIOR OF Ni_3Al: *Z. Xiao* [1]; [1]Auburn University, Materials Research and Education Center, 202 Ross Hall, Auburn, AL 36849 USA

10:10 AM
DESIGN OF OXIDATION RESISTANT COATING BASED ON IrAl ALLOYS: *Hideki Hosoda* [1]; Toshiki Kingetsu[2]; Shuji Hanada[1]; [1]Tohoku University, Institute of Materials Research, 2-1-1 Katahira, Aoba-ku, Sendai 980-77 Japan; [2]Nisshin Steel Company Ltd., Steel & Technology Development Laboratories, Shin-Kokusai Building, 3-4-1 Marunouchi, Chiyoda-ku, Tokyo 100 Japan

10:30 AM
PROCESSING AND PROPERTIES OF DUAL PHASE ALLOYS IN THE Nb-Cr-Ti SYSTEM: *K. C. Chen* [1]; D. J. Thoma[1]; F. Chu[1]; P. G. Kotula[1]; C. M. Cady[1]; G. T. Gray[1]; P. S. Dunn[1]; D. R. Korzekwa[1]; W. O. Soboyejo[2]; C. Mercer[2]; [1]Los Alamos National Laboratory, Los Alamos, NM 87545 USA; [2]The Ohio State University, Columbus, OH 43210 USA

10:50 AM
ALLOY DESIGN STRATEGIES FOR ENHANCED SOLUBILITY RANGES IN MONOLITHIC C15 LAVES PHASES: *D. J. Thoma* [1]; F. Chu[1]; K. C. Chen[1]; P. G. Kotula[1]; [1]Los Alamos National Laboratory, Los Alamos, NM 87545 USA

Materials for Microelectronics and Electronic Packaging: Session III

Thursday AM Room: Honolulu Suite I
July 16, 1998 Location: Tapa Towers

Session Chairs: Yong-Seog Kim, Hong Ik University, Korea; Akio Hiraki, Kochi University of Technology and Osyka University, Japan

8:30 AM INVITED PAPER
TANTALUM POWDER FOR SOLID ELECTROLYTIC CAPACITORS: *George J. Korinek* [1]; [1]Tantalum-Niobium International Study Center (TIC), Rue Washington 40, Brussels 1050 Belgium

8:50 AM INVITED PAPER
CONDUCTIVE ANODIC FILAMENT FAILURE: A MATERIALS PERSPECTIVE: *Laura J. Turbini* [1]; W. Jud Ready[1]; [1]Georgia Institute of Technology, School of Materials Science & Engineering, Atlanta, GA 30332-0245 USA

9:10 AM
MECHANICAL PROPERTIES OF STRUCTURAL POLYURETHANE FOAMS: *S. H. Goods* [1]; C. L. Neuschwanger[1]; C. C. Henderson[1]; L. L. Whinnery[1]; [1]Sandia National Laboratories, Materials Reliability Department, Livermore, CA 94550-0960 USA

9:30 AM
INTERFACIAL REACTION BETWEEN COBALT AND SILICON: *T. Irie* [1]; M. Hashimoto[1]; [1]University of Electro-Communications, Department of Applied Physics and Chemistry, 1-5-1 Chofaoka, Chofu Japan

9:50 AM
THERMAL-MECHANICAL INTERFACE CRACK ANALYSIS OF A TAB ASSEMBLY: *N. H. Yeung* [1]; C. M.L. Wu[1]; J KL Lai[1]; [1]University of Hong Kong, Department of Physics and Materials Science City, 83 Tat Chee Avenue, Hong Kong China

10:10 AM
NON-ELECTROLYTIC SILVER PLATING ONTO NON-CONDUCTING ALUMINA SUBSTRATE: *Seung Chul Lee* [1]; Jae-Ho Lee[1]; [1]Hong Ik University, 72-1 Sangsu-dong, Mapo-gu, Seoul Korea

10:30 AM
A NOVEL METHOD FOR FABRICATION OF HYDROGENATED AMORPHOUS SILICON AND HIGH QUALITY POLY-SI FILMS ON THE SAME SUBSTRATE BY EMPLOYING EXCIMER LASER: *Kwon-Young Choi* [1]; Kee-Chan Park[1]; Min-Koo Han[1]; [1]Seoul National University, Department of Electrical Engineering, Seoul 151-742 Korea

10:50 AM
LATTICE ORIENTATION RELATION OF THE $AuIn_2$ PHASE TO THE Au MATRIX IN THE ALLOYING PROCESS OF GOLD-INDIUM FILMS ON MICA AND NaCl SUBSTRATES: *K. Kifune* [1]; Y. Kubota[1]; K. Yamamoto[1]; T. Tadaki[1]; [1]Osaka Women's University, Department of Natural Science, Sakai, Osaka Japan

11:10 AM
RESIDUAL STRENGTH OF SURFACE MOUNT LEAD-FREE SOLDER JOINTS AFTER THERMAL CYCLING: *N. M. Poon* [1]; C. M.L. Wu[1]; J. K.L. Lai[1]; Y. C. Chan[1]; [1]City University of Hong Kong, Department of Physics and Materials Science, 83 Tat Chee Avenue, Hong Kong China

Melt Processing and Casting: Session II

Thursday AM Room: Iolani Suite VI
July 16, 1998 Location: Tapa Towers

Session Chairs: T. Watanabe, Corporate R&D Laboratories Sumitomo Metal Ind. Ltd., Ibaraka, Japan; Ningfu Shen, Zhengzhou University of Technology, China

8:30 AM INVITED PAPER
NUMERICAL ANALYSIS OF EFFECTS OF ELECTROMAGNETIC BRAKING FORCE ON FLUID FLOW AND HEAT TRANSFER IN FLOW CONTROL MOLD: *H. S. Nam* [1]; P. R. Cha[1]; J. K. Yoon[1]; K. H. Moon[2]; D. Y. Sheng[1]; [1]Seoul National University, School of Materials Science & Engineering, Seoul Korea; [2]POSCO, Kwangyang Technical Research Laboratories, Kwangyang Korea

8:50 AM INVITED PAPER
THE APPLICATION AND DEVELOPMENT OF VANADIUM RESOURCES IN PANZHIBUA: *Zhong yu Zhao* [1]; [1]Panzhibua Iron & Steel (Group) Co., China

9:10 AM
THE APPLICATION OF A STRONG MAGNETIC FIELD TO MATERIALS PROCESSING: *Shigeo Asai* [1]; [1]Nagoya University

9:30 AM
EFFECTS OF ELECTROMAGNETIC FIELD AND COOLING RATE ON INITIAL AND AGING STRUCTURES OF CENTRIFUGAL CASTING HEAT-RESISTANT STEEL: *Xinqiang Wu*[1]; [1]Chinese Academy of Sciences, China

9:50 AM
CELLULAR AUTOMATON FINITE DIFFERENCE MODELING OF MORPHOLOGICAL EVOLUTION DURING ALLOY SOLIDIFICATION: *Ralph E. Napolitano* [1]; Thomas H. Sanders[2]; [1]National Institute of Standards and Technology, Metallurgy Division, Gaithersburg, MD USA; [2]Georgia Institute of Technology, School of Materials Science and Engineering, Atlanta, GA USA

10:10 AM
SHORT CAPILLARY VISCOMETER FOR MOLTEN METALS AND ALLOYS: *Y. Shir aishi* [1]; Y. Sakural[1]; S. Nagasaki[1]; [1]AGNE Gijutsu Center Ltd., Minami-acyama 5-1-25, Kitamura Bldg., Minato-ku 107 Japan

10:30 AM
PRODUCTION OF FINE COPPER - TiN PARTICLES WITH AMMONIA SPLASHING METHOD: *S. Yoko yama* [1]; N. Itoh[1]; S. Nishizawa[1]; M. Kawakami[1]; [1]Toyohashi University of Technology, Dept. of Production Systems Engineering, 1-1 Hibarigaoka, Tempaku-cho, Toyohashi Japan

10:50 AM
NEW PARADIGM FOR THE DESIGN OF SAFETY CRITICAL CASTINGS: *James G. Conley* [1]; Julie Huang[1]; [1]Northwestern University, Mechanical Engineering, 2145 Sheridan Road, Evanston, IL. 60208 USA

11:10 AM
REFINEMENT OF THE MICROSTRUCTURE IN HYPER-EUTECTIC Al-Si ALLOYS BY ELECTROMAGNETIC VIBRATIONS: *Kenji Miw a*[1]; Alireza Radjai[2]; Toshiyuki Nishio[1]; [1]National Industrial Research Institute of Nagoya, AIST, MITI, 1-1 Hirate-cho, Kita-ky, Nagoya 462 Japan; [2]Shiraz University, Department of Materials Science & Engineering, School of Engineering, Shiraz Iran

11:30 AM
SOLIDIFICATION PROCESS OF SILICON FROM HIGH UNDERCOOLED MELTS BY ELECTROMAGNETIC LEVITATION METHOD: *Tomotsugu Ao yama* [1]; Yuzuru Takamura[1]; Kazuhiko Kuribayashi[1]; [1]The University of Tokyo, The Institute of Space and Astronautical Science, 3-1-1 Yoshinodai, Sagamihara, Kanagawa 229 Japan

Phase Transformations and Their Applications: Session VI

Thursday AM Room: Tapa Ballroom II
July 16, 1998 Location: Tapa Towers

Session Chairs: Baixin Liu, Tsinghua University, Beijing, China; S. Ladokhin, National Academy of Sciences of Ukraine, Physico-Technological Institute of Metals and Alloys, Kiev-142 252680, Ukraine

8:30 AM
DIFFUSE SCATTERING AND HUANG SCATTERING IN Al-BASED ICOSAHEDRAL QUASICRYSTALS: *M. Mori* [1]; T. Ishimasa[2]; M. Tanaka[3]; S. Sasaki[4]; [1]Nogoya University, School of Informatics and Sciences, Nagoya Japan; [2]Nagoya University, Department of Nuclear Engineering, School of Engineering; [3]KEK, Photon Factory, Tsukuba 305 Japan; [4]Tokyo Institute of Technology, Materials and Structures Laboratory, Yokohama 226 Japan

8:50 AM
LOCAL ATOM DISPLACEMENTS AROUND CRYSTAL LATTICE DEFECTS INDUCING PHASE TRANSFORMATIONS STUDIED BY MOLECULAR DYNAMICS SIMULATION: *Shunsuke Muto* [1]; Munetaka Takeuchi[2]; Yuji Masuda[2]; Tetsuo Tanabe[1]; [1]Nagoya University, Center for Integrated Research in Science and Engineering (CIRSE), Furo-cho, Chikusa-ku, Nagoya 464-01 Japan; [2]Fujitsu Ltd., 1-9-3 Nakase, Mihama-ku, Chiba 261 Japan

9:10 AM
TEM AND ELECTRON DIFFACTION STUDY ON STRUCTURE AND PHASE TRANSFORMATION OF NANOMETER-SIZED Fe-Ni ALLOY PARTICLES: *T. Tadaki* [1]; K. Asaka[2]; Y. Sechi[2]; Bian Bo[2]; T. Ohkubo[2]; Y. Hirotsu[2]; [1]Osaka Women's University, Dept. of Natural Science, Ibaraki, Osaka 567 Japan; [2]Osaka University, ISIR, Ibaraki, Osaka 567 Japan

9:30 AM
PHASE TRANSFORMATION OF $(Bi_{1-x}\ Ca_x)MnO_3$ STUDIED BY TEM WITH ENERGY FILTERING: *D. Shindo* [1]; Y. Murakami[1]; H. Chiba[2]; M. Kikuchi[2]; Y. Syono[2]; [1]Tohoku University, Institute for Advanced Materials Processing, Katahira 2-1-1, Sendi 980-77 Japan; [2]Tohokyu University, Institute for Materials Research, Katahira 2-1-1 980-77 Japan

9:50 AM
AUSTENITE FORMATION AND ALLOY CARBIDE DISSOLUTION IN Fe-Cr-C STEELS DURING HEATING: *Dmitry V. Shtansky* [1]; Kiyomichi Nakai[1]; Yasuya Ohmori[1]; [1]Ehime University, Department of Materials Science and Engineering, Faculty of Engineering, 3 Bunkyo-cho, Matsuyama 790 Japan

10:10 AM
EFFECTS OF ALLOYING ELEMENTS IN THE INTRAGRANULAR PRECIPITATION IN Cu-Be ALLOY: *Masamic hi Miki* [1]; Kazutaka Morita[1]; Shuhei Ishikawa[2]; Yoshikiyo Ogino[1]; [1]Himeji Institute of Technology, Department of Materials Science and Engineering, Faculity of

Engineering, Himeji 671-22 Japan; [2]NGK Insulators Ltd., Metal Division

10:30 AM
ROLE OF THE INTERLAMELLAR SPACING OF PEARLITE IN THE DILATOMETRIC CHARACTERIZATION OF PEARLITE-TO-AUSTENITEON TRANSFORMATON IN A LOW CARBON STEEL: *C. García de Andrés* [1]; C. Capdevila[1]; F. G. Caballero[1]; [1]CENIM-CSIC, Departamento Metalurgia Fisica, Adva Gregorio del Amo, 8, Madrid, 28040 Spain

10:50 AM
ABNORMAL GRAIN GROWTH IN $BaTiO_3$: *T. Sakuma* [1]; T. Yamamoto[1]; [1]The University of Tokyo, Tokyo, Japan

Smart Materials and Processing: Session II

Thursday AM Room: Iolani Suite V
July 16, 1998 Location: Tapa Towers

Session Chairs: Suk-Joong L. Kang, Taejon, Korea; K. Otsuska, Japan

8:30 AM INVITED PAPER
THE NANO-CERAMIC RESEARCH AND ITS PROSPECT IN CHINA: *Jing Lyn Guo* [1]; [1]Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai China

8:50 AM
MECHANICAL PROPERTIES IN $Al_{94}Cr_1Mn_3Cu_2$ ALLOY STRENGTHENED BY NANOQUASICRYSTALLINE PARTICLES: *Kenji Hig ashi* [1]; Hidetaka Kanahashi[1]; Toshiji Mukai[2]; Hisamichi Kimura[3]; Akihisa Inoue[3]; Kazuhiko Kita[4]; [1]Osaka Perfecture University, Department of Metallurgy and Materials Science, Gaken-cho, Sakai 593 Japan; [2]Osaka Municipal Technical Research Institute, Mechanical Engineering Department, Joto-ku, Osaka 536 Japan; [3]Tohoku University, Institute of Materials Research, Sendai 980 Japan; [4]KKK Corporation, Sendai Institute of Material Science and Technology, Tomiya, Miyagi 981-33 Japan

9:10 AM
STRUCTURE RELAXATION AND GLASS TRANSITION OF Zr-Al-Ni-Cu BULK AMORPHOUS ALLOYS: *T. Zhang* [1]; A. Inoue[1]; [1]Tohoku University, Institute for Materials Research, Sendai 980-77 Japan

9:30 AM
MICROSTRUCTURE CHANGES IN BILAYER FILMS OF PHASE-SEPARATION TYPE ALLOY SYSTEMS: *Minoru Doi* [1]; Yoshihito Yamada[2]; Hiroshi Inaba[1]; Yoshifumi Ueda[1]; [1]Nagoya Institute of Technology, Department of Materials Science and Engineering, Gokisocho, Showa-ku, Nagoya 466 Japan; [2]Nippon Steel Corporation, Hikari Works, Hikari 743 Japan

9:50 AM
LOCAL STRUCTURAL CHANGE OF AMORPHOUS Fe-Zr-B ALLOY IN THE COURSE OF CRYSTALLIZATION STUDIES BY MODERN ELECTRON MICROSCOPE TECHNIQUES: *Y. Hirotsu* [1]; N. Hara[1]; T. Ohkubo[1]; A. Makino[2]; [1]ISIR, Osaka University, Ibaraki, Osaka 567 Japan; [2]Alps Electric Co. Ltd., Central Res. Lab., Nagaoka, Nigata 940 Japan

10:10 AM
EFFECTS OF PASSING ELECTRIC CURRENT ON THE CRYSTALLIZATION PROCESS IN AMORPHOUS ALLOYS: *H. Mizubayashi* [1]; N. Kameyama[1]; [1]University of Tsukuba, Institute of Materials Science, Tsukuba, Ibaraki 305 Japan

10:30 AM
CRITICAL ISSUES IN NANOCRYSTALLINE MATERIALS RESEARCH FOR STRUCTURAL APPLICATIONS AND SOME POTENTIAL SUCCESSFUL APPROACHES: *Shankar M. L. Sastry* [1]; Virgil Provenzano[2]; [1]Washington University, St. Louis, MO 63130 USA; [2]Naval Research Laboratory, Washington, DC 20375 USA

10:50 AM
CONSOLIDATION OF NANOPARTICLES - MODELING AND EXPERIMENTAL VALIDATION: *Shankar M. L. Sastry* [1]; R. Suryanarayanan[2]; [1]Washington University, St. Louis, MO USA; [2]Stanford University, Palo Alto, CA

Welding & Laser Processing: Session III

Thursday AM Room: Iolani Suite III
July 16, 1998 Location: Tapa Towers

Session Chairs: S. A. David, Oakridge National Lab, Metals and Ceramics Division, Oak Ridge, TN 37831-6095, USA; Yong Won Chang, Pohang, Korea

8:30 AM INVITED PAPER
WELDING OF NICKEL-BASE SUPERALLOY SINGLE CRYSTALS - PART 1: *S. A. David* [1]; J. M. Vitek[1]; S. S. Babu[1]; L. A. Boatner[1]; R. W. Reed[1]; [1]Oak Ridge National Laboratory, Metals and Ceramics Division, P.O. Box 2008, Bldg. 4508, Oak Ridge, TN 37831-6095 USA

8:50 AM
WELDING OF NICKEL-BASE SUPERALLOY SINGLE CRYSTALS - PART 2

9:10 AM
CHARACTERIZATION OF WELDS IN GAMMA TITANIUM ALUMINIDES: *Viola L. Acoff* [1]; Anand Ponnusamy[1]; [1]The University of Alabama, Department of Metallurgical and Materials Engineering, Tuscaloosa, AL 35487-0202 USA

9:30 AM
MICROSTRUCTURAL REFINEMENT OF ALUMINUM ALLOYS DURING FRICTION WELDING OF DISSIMILAR METALS: *S. Fukumoto* [1]; M. Ohashi[1]; H. Tsubakino[1]; K. Okita[2]; M. Aritoshi[2]; T. Tomita[2]; [1]Himeji Institute of Technology, Department of Materials Science and Engineering, Faculty of Engineering, 2167, Shosya, Himeji, Hyogo 671-22 Japan; [2]Hyogo Prefectural Institute of Industrial Research

9:50 AM
DEVELOPMENT OF LOW-MELTING ACTIVE-METAL BRAZING FILLER FOR JOINING CERAMICS TO METALS: *Osamu Saitoh* [1]; [1]Yamanasi Technical Center, Technical Dept. Second Division, 2094 Otsu Kofu

10:10 AM
FRICTION WELDING OF ALUMINUM ALLOY TO COPPER AND EVALUATION OF WELDABILITY OF THE JOINTS BY ULTRASONIC METHOD: *Yasuo Sug a* [1]; [1]Keio University

10:30 AM
A STUDY ON THE ELECTRON BEAM WELDABILITY OF HIGH STRENGTH Al ALLOYS FOR THE TRANSPORTATION APPLICATIONS: *S. W. Kim* [1]; C. H. Lee[1]; [1]Hanyang University, Dept. of Metallurgical Engineering, Research Institute of Steel Processes & Applications, 17 Haengdang-dong, Seongdong-ku, Seoul 133-791 Korea

10:50 AM
MICROSTRUCTURE EVOLUTION DURING THE WELDING AND POSTWELD HEAT TREATMENT OF GAMMA TITANIUM ALUMINIDE: *W. A. Baeslac k*[1]; C. M. Jenson[1]; H. Zhang[1]; T. Kelly[2]; [1]Ohio State University, Columbus, OH; [2]GE Aircraft Engine Co.

THURSDAY PM

Advanced Ferrous Alloys: Session IV

Thursday PM Room: Iolani Suite VI
July 16, 1998 Location: Tapa Towers

Session Chairs: Yeon-Chul Yoo, Inha University, Korea; Honglin Ge, China

1:30 PM INVITED PAPER
THE EVOLUTION OF THE GOSS TEXTURE IN SILICON STEEL: *Dong Nyung Lee* [1]; Hyo-Tae Jeong[1]; [1]Seoul National University, Division of Materials Science and Engineering, Research Center for Thin Film Fabrication and Crystal Growing of Advanced Materials, Seoul 151-742 Korea

1:50 PM INVITED PAPER
AN ABNORMAL EFFECT OF PHOSPHORUS ON MECHANICAL PROPERTIES IN NICKEL-BASE SUPERALLOYS OF Ni-Cr-Fe-Ni-Cr-Fe-Mo and Ni-Cr-Fe-Mo-Nb-Al SYSTEMS: *Xishan Xie*[1]; [1]China

2:10 PM
DESIGN OF FIRE-RESISTANT STEELS FOR CONSTRUCTION: *W. Sha* [1]; F. S. Kelly[1]; [1]The Queen's University of Belfast, Department of Civil Engineering, Belfast BT7 1NN UK

2:30 PM
PREPARATION OF Fe-C SYSTEM ALLOYS BY MECHANICAL ALLOYING: *Nurul Tauf iqu Roc hman* [1]; [1]Kagoshima University, Kagoshima, 890 Japan

2:50 PM
SOLUBILITY PRODUCT OF VN IN AUSTENITE: *T. Gendo* [1]; K. Morita[1]; K. Inoue[1]; H. Ohtani[2]; K. Ishida[3]; [1]Tohoku University, Sendai 980-77 Japan; [2]Tohoku University, Center for Interdisciplinary Research, Sendai 980-77 Japan; [3]Tohoku University, Graduate School of Engineering, Sendai 980-77 Japan

3:10 PM
AUSTEMPERING OF ALLOYED DUCTILE IRONS: *Sasan Yazdani* [1]; Roy Elliott[1]; [1]Manchester Materials Science Centre, Grosvenor Street, Manchester M1 7HS UK

3:30 PM
CICLIC PROPERTIES OF A TITANIUM AND NIOBIUM MICROALLOYED STEEL IN SOME MICROSTRUCTURAL CONDITIONS: *Enrico Jose Giordani* [1]; Jairo Aparecido Martins[1]; Itamar Ferreira[1]; [1]Faculdade de Engenharia Mecanica/UNICAMP, Departmento de Engenharia de Materiais, Caixa Postal 6122, 13083-970, Campinas, SP Brazil

3:50 PM
THE RELATIONSHIP BETWEEN TEXTURE AND MAGNETIC PROPERTIES OF Si STEEL SHEET: *N. Chen* [1]; [1]University of Science and Technology, Beijing China

General Abstracts: Session VI

Thursday PM Room: Iolani Suite I
July 16, 1998 Location: Tapa Towers

Session Chairs: C. S. Lee, POSCO, Technical Research Lab, Pohang, Korea; T. Aizawa, University of Tokyo, Department of Metallurgy, Tokyo, Japan

1:30 PM
HOT PRESSING OF DIAMOND/ALUMINA COMPOSITES UNDER THE THERMODYNAMICALLY METASTABLE CONDITION FOR THE DIAMOND: *Shoichi Kume* [1]; Kazutaka Suzuki[1]; Haruo Yoshida[2]; Naoyuki Kanetake[3]; [1]National Industrial Research Institute of Nagoya (NRIN), 1-1 Hirate-cho, Kita-ku, Nagoya 462 Japan; [2]National Institute for Advanced Interdisciplinary Research (NAIR), 1-1-4 Higashi, Tsukuba, Ibaraki 305 Japan; [3]Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-01 Japan

1:50 PM
MOVPE PRODUCTION REACTORS FOR HIGH TEMPERATURE ELECTRONICS: *H. Protzmann* [1]; B. Wachiendor[1]; O. Schon[1]; D. Schmitz[1]; G. Strauch[1]; H. Jurgensen[1]; [1]AIXTRON AG, Kackertstr, Aachen 15-17 Germany

2:10 PM
COMBINATION TESTS ON TiAl INVOLVING CONSTANT STRAIN-RATE DEFORMATION, ANNEALING AND CREEP: *T. S. Rong* [1]; I. P. Jones[1]; R. E. Smallman[1]; [1]The University of Birmingham, School of Metallurgy & Materials, Birmingham, B15 2TT UK

2:30 PM
IMPROVEMENT TO THE GROWTH CONDITIONS OF U-IV COMPOUNDS BY FORCED CONNECTION: *Zhonghou Li* [1]; [1]Northwestern Polytechnical University, Xi'an China

2:50 PM
SOLID-STATE AMORPHIZATION SIMULAITION AND EXPERIMENTS: *B. X. Liu* [1]; [1]Tsinghua University, Beijing China

3:10 PM
SOLIDIFICATION PROCESS OF ROTATING BLADES MELT QUENCHED ALUMINUM ALLOYS: *Yati Tang* [1]; [1]Zhongzhou University of Technology, China

3:30 PM
ANALYSIS OF IN SITU FORMATION OF TITANIUM CARBIDE VIA DIRECT REACTION IN MOLTEN ALUMINUM: *B. Yang* [1]; [1]Chinese Academy of Sciences, China

High Transition Temperature Superconductors: Session I

Thursday PM Room: Honolulu Suite II
July 16, 1998 Location: Tapa Towers

Session Chairs: U. Balachandran, Argonne National Laboratory, Energy Technology Division, Argonne, IL 60439, USA; Lian Zhou, Northwest Institute for Nonferrous Metal Research, China

1:30 PM INVITED PAPER
MATERIALS AND DESIGN CONCEPTS FOR A 1000HP SUPERCONDUCTING HOMOPOLAR MOTOR: *Donald U. Gubser* [1]; [1]Naval Research Laboratory, Code 6300, 4555 Overlook Avenue SW, Washington, DC 20375-5346 USA

1:50 PM INVITED PAPER
ADVANCES IN PROCESSING OF Ag-SHEATHED $(Bi,Pb)_2Sr_2Ca_2Cu_3O_x$: *U. Balachandran*[1]; M. Lelovic[2]; N. G. Eror[2]; P. Haldar[3]; [1]Argonne National Laboratory, Energy Technology Division, Argonne, IL 60439 USA; [2]University of Pittsburgh, Department of Materials Science and Engineering, Pittsburgh, PA 15261; [3]Intermagnetics General Corporation, Latham, NY 12110 USA

2:10 PM INVITED PAPER
CRITICAL CURRENTS ACROSS SMALL ANGLE GRAIN BOUNDARIES IN HIGH T_c SUPERCONDUCTORS: *C. S. Pande* [1]; R. A. Masumura[1]; [1]Naval Research Laboratory, Materials Science and Technology, Washington, DC 29375-5343 USA

2:30 PM INVITED PAPER
RESEARCH AND DEVELOPMENT OF SUPERCONDUCTING MATERIALS IN CHINA: *Lian Zhou* [1]; [1]Northwest Institute for Nonferrous Metal Research China

2:50 PM
CHEMICAL ENGINEERING OF HIGH-Tc SUPERCONDUCTORS VIA CHEMICAL DOPING: *R. S. Liu* [1]; J. M. Chen[2]; R. G. Liu[2]; [1]National Taiwan University, Department of Chemistry, Taipei, Taiwan ROC; [2]Synchrotron Radiation Research Center (SRRC), Hsinchu, Taiwan ROC

3:10 PM
CONGRUENT GROWTH OF $NdBa_2Cu_3O_{7-x}$ SUPERCONDUCTING OXIDE FROM THE HIGHLY UNDERCOOLED MELT BY CONTAINERLESS PROCESSING: *K. Nagashio* [1]; Y. Takamura[1]; K. Kuribayashi[1]; [1]The University of Tokyo, Graduate School of Engineering, The Institute of Space and Astronautical Science, 3-1-1 Yoshindai, Sagamihara-shi, Kanagawa 229 Japan

3:30 PM
BONDABILITY AND SUPERCONDUCTIVITY OF YBCO CERAMICS WITH In2O3 ADDITIVES: *Akio Suzumura*[1]; [1]Tokyo Institute of Technology

3:50 PM
PROCESSING OF EPITAXIAL, BIAXIALLY-TEXTURED Y-Ba-Cu-O SUPERCONDUCTING THICK FILMS ON METAL SUBSTRATES BY METAL ORGANIC CHEMICAL VAPOR DEPOSITION: *V. Selvamanickam* [1]; J. D'Frank[1]; C. Trautwein[1]; S. Alles[1]; P. Halder[1]; M. Lanagan[2]; M. Lelovic[3]; [1]Intermagnetics General Corporation, 450 Old Niskayuna Road, Latham, NY 12110 USA; [2]Argonne National Laboratory, Argonne, IL 60439; [3]University of Pittsburgh, Pittsburgh, PA 15261

4:10 PM
IMPROVING THE MICROSTRUCTURE OF B12223 TAPES FOR HIGH CRITICAL CURRENT DENSITIES: *Q. Y. Hu* [1]; S. Li[1]; H. K. Liu[1]; S. X. Dou[1]; [1]University of Wollongong, Center for Superconducting and Electronic Materials, Wollongong NSW 2500 Australia

Non-Destructive Characterization: Session I

Thursday PM Room: Honolulu Suite I
July 16, 1998 Location: Tapa Towers

Session Chairs: R. Green, The Johns Hopkins University, Materials Science & Engineering Department, Baltimore, MD 21218, USA; Roman Maev, University of Windsor, Windsor, Canada

1:30 PM INVITED PAPER
APPLICATION OF NONDESTRUCTIVE MATERIALS CHARACTERIZATION TECHNIQUES TO ADVANCED MATERIALS AND PROCESSING: *Robert E. Green* [1]; [1]The Johns Hopkins University, Materials Science & Engineering Department, Baltimore, MD 21218 USA

1:50 PM INVITED PAPER
FIM IMAGE FORMATION FOR ORDERED ALLOYS: *Chen Nanxian* [1]; [1]University of Science and Technology, Beijing China

2:10 PM INVITED PAPER
PROBABILISTIC ASPECTS OF AGING OF AIRFRAME MATERIALS: DAMAGE VERSUS DETECTION: *D. G. Harlow*[1]; R. P. Wei[1]; [1]Lehigh University, Department of Mechanical Engineering and Mechanics, 19 Memorial Drive West, Bethlehem, PA 18015-3085 USA

2:30 PM INVITED PAPER
SEXI: A NEW PORTABLE SPECTROMETER FOR X-RAY DIFFRACTION AND X-RAY FLUORESCENCE ANALYSIS IN REAL TIME FOR NON DESTRUCTIVE TESTING OF MATERIALS: *Federica Paglietti* [1]; Paolo Plescia[1]; [1]CNR National Council of Research, Institute for Mineral Processing, Rome Italy

2:50 PM INVITED PAPER
ULTRASONIC CHARACTERIZATION OF ANISOTROPIC MATERIALS: *Roman G. Maev* [1]; *Brian E. O'Neill* [1]; [1]University of Windsor, Physics, 401 Sunset Ave., Windsor, ON N9B 3P4 Canada

3:10 PM
REAL-TIME MONITORING AND CONTROL OF $GA_XIN_{1-X}P$ HETEROSTRUCTURES BY P-POLARIZED REFLECTANCE SPECTROSCOPY: *Nikolaus Dietz* [1]; D. E. Aspnes[1]; K. J. Bachmann[2]; M. Ebert[1]; [1]North Carolina State University, Physics, Box. 7919, 215 RB1, 1001 Capability Dr., Raleigh, NC 27695-7919 USA; [2]North Carolina State University, Materials Science & Eng., Box 7919, Raleigh, NC 27695 USA

3:30 PM
MICROWAVE INSPECTION OF NAVAL MULTI-LAYER COMPOSITES, AN OVERVIEW: *Lawrence Brown* [1]; Johnnie DeLoach[1]; Nasser Qaddoumi[2]; Reza Zoughi[2]; [1]Naval Surface Warfare Center, Carderock Division, W.Bethesda, MD USA; [2]Colorado State University, Applied Microwave Technology Laboratory, Ft. Collins, CO USA

3:50 PM
CHARACTERIZATION OF LOCAL FLOW BEHAVIOUR AND FRACTURE CHARACTERISTICS USING ADVANCED INDENTATION TECHNIQUE: *Y. H. Lee* [1]; [1]Seoul National University

4:10 PM
NONDESTRUCTIVE EVALUATION OF FRACTURE TOUGHNESS,K_{IC}, OF TURBIN ROTOR STEEL BY THE MAGNETIC BARKHAUSEN NOISE: *Jin Ik Suk* [1]; Un Hak Sung[1]; Min Soo Kim[1]; [1]Korea Heavy Industries & Construction Co. Ltd., R&D Center, ChangWon Korea

Phase Transformations and Their Applications: Session VII

Thursday PM Room: Tapa Ballroom II
July 16, 1998 Location: Tapa Towers

Session Chairs: W. Sha, Queen's University of Belfast, Belfast, UK; S. K. Sharma, University of Hawaii, USA

1:30 PM INVITED PAPER
STM/AFM STUDY OF SURFACE RELIEF INDUCED IN THE PHASE TRANSFORMATION OF ZrO_2-Y_2O_3 Fe-Ni-C AND Cu-Al-Ni ALLOYS: *Masahiko Yamamoto* [1]; [1]Osaka University, Department of Materials Science and Engineering, 2-1 Yamada-Oka, Suita-shi, Osaka-fu 565 Japan

1:50 PM INVITED PAPER
MODIFICATIONS IN THE MARTENSITIC TRANSFORMATION OF 0.45C-13Cr CAUSED DURING THE CONTINUOUS COOLING PROCESS WITH AND WITHOUT PRECIPITATION OF $M_{23}C_6$ CARBIDES: *G. García de Andrés* [1]; L. F. Alvarez[1]; [1]Centro Nacional de Investigaciones Metalurgicas (CENIM), Department of Physical Metallurgy, Consejo Superior, de Investigaciones Cientificas (CSIC), Avda. Gregorio del Amo, 8, Madrid 28040 Spain

2:10 PM
MORPHOLOGY OF MARTENSITE IN Fe-Ni-Si SYSTEM: *O. Ikeda* [1]; R. Kainuma[1]; K. Ishida[1]; [1]Tohoku University, Department of Materials Science, Graduate School of Engineering, Sendai 980-77 Japan

2:30 PM
THE GROWTH PATH METHOD FOR PREDICTION OF STRAY GRAIN NUCLEATION IN SINGLE-CRYSTAL CASTING: *Ralph E. Napolitano* [1]; Andrew R. Roosen[1]; R. J. Schaefer[1]; [1]National Institute of Standards and Technology, Metallurgy Division, Gathersburg, MD USA

2:50 PM
THE RELATION BETWEEN PHASE TRANSFORMATION AND GRAIN SIZE IN Y_2O_3 PARTIALLY STABILIZED ZIRCONIA: *H. Tsubakino* [1]; T. Isobe[1]; B. Zhang[1]; [1]Himeji Institute of Technology, Department of Materials Science & Engineering, Faculty of Engineering, 2167 Shosha, Himeji 671-22 Japan

3:10 PM
PHASE TRANSFORMATION IN 9 mol% MgO-PARTIALLY STABILIZED ZIRCONIA DURING AGING AND THERMAL CYCLING: *Bin Zhang* [1]; T. Isobe[1]; H. Tsubakino[1]; [1]Himeji Institute of Technology, 2409-5 Shosha, Himeji, Hyoga 671-2201 Japan

3:30 PM
AMORPHOUS TO NANOCRYSTALLINE TRANSFORMATIONS IN ELECTRODEPOSITED Ni-W ALLOYS: *Tohru Yamasaki* [1]; Rika Tomohira[1]; Yoshikiyo Ogino[1]; [1]Himeji Institute of Technology, Department of Materials Science & Engineering, Faculty of Engineering, C2167 Shosha, Himeji 671-22 Japan

3:50 PM
PHASE EQUILIBRIUM CALCULATIONS IN THE Pu-Ga-O SYSTEM: *Marius Stan* [1]; Terry D. Wallace[1]; Darryl P. Butt[1]; [1]Los Alamos National Laboratory, MST-6, P.O. Box 1663, M.S. G-755, Los Alamos, NM 87545 USA

4:10 PM
MA'ed AND HIP'ed TiH2-Al COMPACTS DISPLAYING ENCOURAGING MECHANICAL PROPERTY LEVELS: *S. Ozbilen* [1]; [1]Gazi University, Fac. of Tech. Educ., Metallurgical Educ. Dept., Ankara Turkey

Smart Materials and Processing: Session III

Thursday PM Room: Iolani Suite V
July 16, 1998 Location: Tapa Towers

Session Chairs: Y. Hirotsu, ISIR, Osaka University, Ibarakik, Japan; Ronghou Teng, Central Iron & Steel Research, Beijing, China

1:30 PM INVITED PAPER
PROPERTIES OF NANOCRYSTALLINE ELECTRODEPOSITED Ni-Fe ALLOYS: *H. Kim* [1]; C. M. Gilmore[1]; [1]George Washington University, Institute for Materials Science, School of Engineering and Applied Science, Washington, DC 20052 USA

1:50 PM INVITED PAPER
STRAIN SELF-ASSEMBLED In (Ga) As/GaAs QUANTUM DOT MATERIALS GROWTH AND DEVICE APPLICATION: *Zhanguo Wang* [1]; [1]Institute of Semiconductors, Chinese Academy of Sciences, China

2:10 PM INVITED PAPER
ELECTRONIC STRUCTURE AND ENERGY OF IMPURITY - DEFECT COMPLEXES IN METAL: *Chong Yu*[1]; [1]Central Iron & Steel Research Institute, Beijing China

2:30 PM
THE NEW APPROACHES FOR STRUCTURAL CERAMICS STRENGTHENING AND TOUGHENING: *Jing Lyn Guo* [1]; [1]Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai China

2:50 PM
TITANIUM OXIDE FILM: A NEW BIOMATERIAL FOR ARTIFICAL HEART VALVE PREPARED BY ION BEAM ENHANCED DEPOSITION: *Xianghuai Liu* [1]

3:10 PM
STUDY ON NOVEL POLYIMIDES ALIGNMENT MATERIALS BASED ON AN ALICYCLIC DIAHYDRIDE AND LONG ALKYL CHAIN CONTAINING DIAMICS: *Jie Yin*[1]; [1]Shanghai Jiao Tong University, Shanghai China

3:30 PM
QUANTITATIVE STUDY OF CuAlNi SHAPE MEMORY ALLOY UNDER 4-POINT-BENDING BY MOIRE INTERFEROMETRY: *Terry T. Xu* [1]; [1]Hong Kong Univ. of Sci & Tech, Dept. of Mech. Eng., Clear Water Bay, Kowloon, Hong Kong PR China

3:50 PM
SYNTHESIS AND CHARACTERIZATION OF xBaO-(Mg_2Al_3-$Si_{4.5}O_\gamma$ GLASS-CERAMICS FROM Sol-Gel PROCESS: *Yi Hu*[1]; H. -T. Tsai[1]; [1]Tatung Institute of Technology, Department of Materials Engineering, Taipei, Taiwan 104 ROC

4:10 PM
STUDY ON NOVEL FLUORINATED COPOLYINIDES BASED SECOND-ORDER NON-LINEAR OPTICAL MATERIAL: *Zongguang Wang* [1]; [1]Shanghai Jiao Tong University, China

Welding & Laser Processing: Session IV

Thursday PM — Room: Iolani Suite III
July 16, 1998 — Location: Tapa Towers

Session Chairs: K. Mukherjee, Michigan State University, Dept. Materials Science and Mechanics, East Lansing, MI 48824, USA; R. J. Wong, Naval Surface Warfare Center, Carderock Divison, West Bethesda, MD 20817-5700, USA

1:30 PM INVITED PAPER
USE OF INTERMETALLIC ALLOYS AS ADDITIONS TO TUNGSTEN ELECTRODES - PART 1: *David L. Olson* [1]; Stephen Liu[1]; Steven Caldwell[2]; [1]Colorado School of Mines, Center for Welding, Joining and Coatings Research, Golden, CO 80401 USA; [2]Teledyne Advanced Materials, La Vergne, TN 37086

1:50 PM
USE OF INTERMETALLIC ALLOYS AS ADDITIONS TO TUNGSTEN ELECTRODES - PART 2

2:10 PM
PROCESSING OF MATERIALS WITH EXPLOSIVES: *Osman T. Inal*[1]; Efe Ege[1]; C. A. Zimmerly[1]; [1]New Mexico Tech, Materials and Metallurgical Engineering Department, Socorro, NM 87801 USA

2:30 PM
DEVELOPMENT OF AN IMPROVED Mil-100S WIRE FOR NAVAL SHIP CONSTRUCTION: *J. J. DeLoac h*[1]; J. M. Blackburn[1]; R. J. Wong[1]; G. L. Franke[1]; [1]Naval Surface Warfare Center, Carderock Division, West Bethesda, MD 20817-5700 USA

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DEVELOPMENT OF NEW WELDABILITY TEST METHODS FOR HIGH STRENGTH STEELS: *R. J. Wong* [1]; [1]Naval Surface Warfare Center, Carderock Division, West Bethesda, MD 20817-5700 USA

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THE INFLUENCE OF WELD MICROSTRUCTURAL FEATURES ON CORROSION BEHAVIOR: *B. Mishr a*[1]; D. L. Olson[1]; [1]Colorado School of Mines, Center for Welding, Joining and Coatings Research, Golden, CO 80401-1887 USA

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ENHANCEMENTS IN ALUMINUM ALLOY WELD METAL THROUGH ADDITIONS OF WELD METAL GRAIN REFINERS: *K. E. Johns* [1]; R. H. Frost[1]; D. L. Olson[1]; [1]Colorado School of Mines, Center for Welding, Joining and Coatings Research, Golden, CO 80401 USA

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ELECTRON BEAM WELDING OF CAST GAMMA TITANIUM ALUMINIDE (Ti-48-Al-2Cr-2Nb): *Thomas J. Kelly* [1]

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COMBUSTION SYNTHESIS AS A TECHNIQUE TO JOIN ADVANCED MATERIALS: *Welping Liu* [1]; [1]Dalian Railway Institute, China

Poster Presentations

Tuesday AM — Room: Tapa Ballroom I
July 14, 1998 — Location: Tapa Towers

(1) EFFECTS OF Zr-ADDITION ON PHASE STABILITY AND PHASE TRANSFORMATIONS IN A Ti-50at.% Al ALLOY: *Kiyomic hi Nakai* [1]; Osamu Yamada[1]; Yasuya Ohmori[1]; [1]Ehime University, Department of Materials Science and Engineering, Faculty of Engineering, 3 Bunkyo-cho, Matsuyama 790-77 Japan

(2) OXIDATION RESISTANCE AT HIGH TEMPERATURES OF STAINLESS STEEL COMPACTS PRODUCED BY MECHANICAL GRINDING: *S. Tanabe* [1]; W. Takahara[1]; H. Nishida[1]; [1]Osaka Prefecture University, Metallurgy and Materials Science, College of Engineering, 1-1 Gakuen-cho, Sakai, Osaka 599 Japan

(3) NUMERICAL SIMULATION FOR PUSHING AND ENGULFMENT OF A PARTICLE BY SOLID-LIQUID INTERFACE: *Machiko Ode* [1]; Toshio Suzuki[1]; Seong Gyoon Kim[2]; [1]University of Tokyo, School of Engineering, Tokyo Japan; [2]Kunsan National University, Kunsan Korea

(4) MOPHOLOGY AND CRYSTALLOGRAPHY OF TRIPLE POINT NUCLEATED PHASE IN AN ($\alpha\varphi$) TWO PHASE STAINLESS STEEL: *T. Maeda* [1]; H. Fujiwara[1]; N. Miyano[1]; K. Ameyama[2]; [1]Ritumeikan University, 1-1-1 Noji-higashi, Kusatsu, Shiga 525-77 Japan; [2]Ritumeikan University, Department of Mechanical Engineering, Faculty of Science and Engineering

(5) ANALYSIS OF NONEQUILIBRIUM DISSIPATION DURING FATIGUE-FRACTURE OF METALS: *Jiang yang Hu* [1]; [1]Wuhao University of Technology, China

(6) MATHEMATIC MODEL FOR DESIGN OF BILLET OF STEEL TUBE: *Guofu Cao* [1]; [1]Tai Zhou Steel Tube Factory, Jiansu

(7) COMPOSITE CAST SILICIDE TARGETS FOR DEPOSITION OF THIN SILICIDE FILMS: *V. G. Glebovsky* [1]; S. N. Ermoiov[1]; E. D. Stinov[1]; [1]Institute of Solid State Physics, RAS, Chernogolovka, Moscow 14243 Russia

(8) STUDY ON FIRE RESISTANT TITANIUM ALLOYS: *Yongquing Zhao* [1]; [1]Northwest Institute for Nonferrous Metal Research

(9) INVESTIGATION OF UNEVEN DISTRIBUTION OF MICROSTRUCTURE WITHIN Ag-SHEATHED Bi-2223 SUPERCONDUCTING TAPES: *Yanwei Ma* [1]; [1]University of Technology and Science, Beijing China

(10) GROWTH MECHANISM OF Al_2O_3 GRAINS IN CERAMIC-LINED PIPES: *Jinshu Wang* [1]; [1]Baoshan Steel Corporation, Shanghai China

(11) EFFECT OF PROCESSING PROCEDURE ON CRITICAL CURRENT DENSITY OF Ag-SHEATHED (Bi,/Pb)2Sr2Ce2Cu3Ox SUPERCONDUCTING TAPES: *Yanwei Ma* [1]; [1]University of Scinece and Technology, Beijing China

(12) STUDY ON HOT PLASTICITY OF GN742 ALLOY: *J. Wang* [1]; [1]Shanghai No. 5 Steel Co., China

(13) THE EFFECT OF COOLING RATE ON As-CAST STRUCTURE IN FINE GRAIN CASTING OF In718 ALLOY: *Ma Yue* [1]; [1]University of Science and Technology, Beijing China

(14) STUDY OF PLASTIC PROPERTIES OF HOP-LATTICE METALS UNDER AXIAL TEXTURE: *Jianyang Hu* [1]; [1]Wuhan University of Technology, China

(15) PREPARATION AND CHARACTERIZATION OF ORGANIC-INORGANIC COMPOSITE AERGELS: *Yimin Chen* [1]; [1]Iron & Steel Research Institute, China

(16) ELECTRON TRANSPORT THROUGH A MOSOSCOPIC RING WITH A QUANTUM DOT: *Binglin Gu* [1]; [1]Tsinghua University, China

(17) PRODUCTIVE TECHNOLOGY OF V-Nb STRIP STEELS FOR X SERIES SPIRAL PIPES IN BaoSTEEL: *Wentao Rao* [1]; [1]Hot Strip Rolling Mill of Bao Steel, China

(18) SURFACE METALLURGY OF Ni-BASE TYPE WITH THE DOUBLE GLOW DISCHARGE PLASMA METALIZING: *Zhang Xu*[1]; [1]University of Science and Technology, Beijing China

(19) INVESTIGATION ON CRITICAL TECHNIQUES OF IRON-POWDER VAM COMPACTION: *Shiju Guo* [1]; [1]University of Science and Technology, Beijing China

(20) MECHANICAL PROPERTIES AND MICROSTRUCTURES OF Mg-Zn-(Mn) ALLOYS FABRICATED UNDER AN Ar GAS ATMOSPHERE: *Jeong-Pil Eom* [1]; Su-Guen Lim[1]; Bo-Young Hur[1]; [1]Gyeongsang National University, Dept. of Metallurgical & Materials Eng., Research Center for Aircraft Parts Technology, Gyeongsang Korea

(21) OXIDATION AND CORROSION OF MCrAlX OVERLAY COATINGS AND DIFFUSION ALUMINIDE: *Jingui Sun* [1]; [1]Univeristy of Science and Technology, Beijing China

(22) RECORROSIVITY OF NEW-TYPE Nb BASE ALLOY: *Huang Tewei*[1]; [1]Central Iron & Steel Research Institute, Beijing China

(23) HIGH TEMPERATURE STRENGTH OF MICROSTRUCTURE-CONTROLLED Nb_3Al/Nb_{ss} IN-SITU COMPOSITES IN Nb-Al-Mo TERNARY SYSTEM: *Tatsuo Tabaru* [1]; Shuji Hanada[1]; [1]Tohoku University, Institute for Materials Research, 2-1-1 Katahira, Aoba-ku, Sendai 980-77 Japan

(24) ANALYSIS OF RESIDUAL STRESS IN DAMPED ALTERNATING BENDING OF SHEET METAL: *Mashide K ohzu* [1]; Takanori Nishoka[1]; Takuji Enomoto[1]; [1]Osaka Prefecture University, Metallurgy and Materials Science, College of Engineering, 1-1 Gakuen-cho, Sakai, Osaka 559 Japan

(25) TiN FORMATION IN THE Ti-B SYSTEM DURING REACTIVE MECHANICAL ALLOYING: *S. Ozbilen* [1]; [1]Gazi University, Fac. of Tech. Educ., Metallurgical Educ. Dept., Ankara Turkey

(26) ANTIOXIDATION COATING FOR THE ALLOY STEEL AT HIGH TEMPERATURE: *Xu Xiaoliang* [1]; Lu Dong[1]; Liao Xiangwei[1]; [1]Anshan Iron & Steel Group Complex, Technology Center, No. 63 Wuyi Road, Anshan, Liaoning 114001 China

(27) HIGH TEMPERATURE LOAD RELAXATION BEHAVIOR OF β-BRASS ALLOY: *K. A. Lee* [1]; Y. W. Chang[1]; C. S. Lee[1]; [1]Pohang University of Science and Technology, Center for Advanced Aerospace Materials, San 31, Hyoja-dong, Pohang 790-784 Korea

(28) A STUDY ON THE GRAIN REFINING AND AGE HARDENING OF Mg-Zn-Cu AND Mg-Zn-Si ALLOYS: *In-Shup Ahn* [1]; Tae-Hyun Nam[1]; Yoo-Young Kim[1]; [1]Gyeongsang National University, Dept. of Metallurgical & Materials Engineering and Research Center for Aircraft Parts Technology, Gajwa-Dong 900, Chinju, Gyeongnam 660-701 Korea

(29) IMPROVEMENT ON SURFACE OF CAST IRON BY USING ALLOY POWDERS ON THE MOLD: *Shig enori Tana be* [1]; Yasuo Horikawa[1]; Kimitugu Yoshikawa[1]; [1]Osaka Prefecture University, Metallurgy and Materials Science, College of Engineering, 1-1 Gakuen-cho, Shakai, Osaka Japan

(30) THE INTRINSIC PROPERTIES, CRITERIA AND RESEARCH PROPERTIES OF NANO-MATERIALS: *Ronghou Teng* [1]; [1]Central Iron & Steel Research Institute, Beijing China

(31) AE AND XPS ANALYSIS OF AIR ANNEALED AMORPHOUS Fe 73.5 Cul NB3 Sil3.5 B9 ALLOY: *W. Z. Chen* [1]; [1]Central Iron & Steel Research Institute

(32) STUDY ON THE SOUND ABSORBING PROPERTIES OF THE ALUMINUM FOAM MATERIALS: *Yong Zhang* [1]; [1]Shangdon Institute of Engineering, Zibo China

(33) NiCoCrAlSiHfY-Al GRADED OVERLAY COATING BY MAS-UETRON SPUTTERING WITH DOUBLE TARGETS: *Ruizeng Ye* [1]; [1]University of Science and Technology, Beijing China

(34) A STUDY FOR TECHNOLOGY OF MAKING FOAM Al-ALLOYS: *Siyi Yang* [1]; [1]Shandong Institute of Technology

(35) MICROSTRUCTURAL EVOLUATION AND MECHANICAL BEHAVIOR OF Ni_3Al-Fe/B ALLOY: *Gang Li* [1]; [1]University of Science and Technology, Beijing China

(36) THE EFFECT OF THE SOLIDIFICATION RATE ON THE HYDROGEN STORAGE PROPERTIES OF Mi(NiCoMnTi), ALLOYS: *Chuanjian Li* [1]; [1]Central Iron & Steel Research Institute, Beijing China

(37) MECHANICAL ALLOYING OF PLATINUM GROUP METAL WITH Zr or Al: *Takayuki Tsuzuki* [1]; Tsuyoshi Arakaw[1]; [1]Kinki University in Kyushu, Department of Industrial Chemistry, Faculty of Engineering, Kayanomori, Uzuka, Fukuoka 820 Japan

(38) MICROSTRUCTURE AND MECHANICAL PROPERTIES OF Nb-Mo-TiC EUTECTIC COMPOSITES: *N. Nomur a*[1]; K. Yoshimi[2]; S. Hanada[2]; [1]Tohoku University, Department of Materials Processing, Sendai 980-77 Japan

(39) STRENGTHENING AND MECHANICAL STABILITY OF In-Situ Cu-Fe-Xi COMPOSITES: *Jae Sook Song* [1]; Moon Soo Lim[1]; Sun Ig Hong[1]; Kwang Koo Jee[2]; [1]Chungnam National University, Department
of Meturgical Engineering, Taedock Science Town, Taejon 305-764 Korea

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