

# Schedule of Events

## 60TH DEVICE RESEARCH CONFERENCE

### SUNDAY PM, JUNE 23<sup>RD</sup>, 2002

Registration ..... 4:00PM–9:00PM  
Location ..... University Center/Multicultural Lounge  
Welcoming Reception ..... 6:00PM–8:00PM  
Location ..... Lagoon Plaza

### MONDAY AM, JUNE 24<sup>TH</sup>, 2002

Registration ..... 7:30AM–5:00PM  
Location ..... University Center/Multicultural Lounge  
Plenary Session ..... 8:30AM  
Location ..... Corwin Pavilion

### MONDAY PM, JUNE 24<sup>TH</sup>, 2002

Session II.A. Nitride Electronic Devices ..... 1:40PM  
Session II.B. Si-Based Devices ..... 1:30PM  
Session III. Poster Session ..... 5:30PM–8:30PM  
Poster Session Reception ..... 5:30PM–8:30PM  
Location ..... Lagoon Plaza

### TUESDAY AM, JUNE 25<sup>TH</sup>, 2002

Registration ..... 7:30AM–5:00PM  
Location ..... University Center/Multicultural Lounge  
Session IV. Emerging Technologies ..... 8:30AM

### TUESDAY PM, JUNE 25<sup>TH</sup>, 2002

Session V.A. Optical Devices ..... 2:00PM  
Session V.B. Nanoscale & Tunneling Devices ..... 2:10PM  
Conference Picnic ..... 6:00PM–8:00PM  
Location ..... Goleta Beach  
Rump Session ..... 8:00PM–10:30PM  
Location ..... Corwin East & Corwin West

### WEDNESDAY AM, JUNE 26<sup>TH</sup>, 2002

Registration ..... 7:30AM–1:00PM  
Location ..... University Center/Multicultural Lounge  
Joint Plenary Session with EMC ..... 8:20AM  
Session VI.A. III-V Devices ..... 10:00AM  
Session VI.B. Late News Papers ..... 10:00AM

### WEDNESDAY PM, JUNE 26<sup>TH</sup>, 2002

Session VII.A. Column IV Power Devices ..... 2:00PM  
Session VII.B. MOS Dielectrics ..... 2:10PM

# Table of Contents

## SESSION I. PLENARY SESSION

1-20

- I-1 **“From Electron Tubes to Nanostructures: 60 Years of Electron Device Research”** *H. Kroemer*<sup>1</sup>; <sup>1</sup>University of California at Santa Barbara, Dept. of Electl. & Compu. Eng., & Dept. of Matls., Santa Barbara, CA 93106 USA
- I-2 **“RF MEMs for Wireless Applications”** *C. T.-C. Nguyen*<sup>1</sup>; <sup>1</sup>University of Michigan, Ctr. for Wireless Microsys., Ann Arbor, MI 48109 USA
- I-3 **“Advanced MEMs for Photonics”** *M. C. Wu*<sup>1</sup>; *P. R. Patterson*<sup>1</sup>; *D. Hah*<sup>1</sup>; *M. C.M. Lee*<sup>1</sup>; *S. Huang*<sup>1</sup>; *J.-C. Tsai*<sup>1</sup>; <sup>1</sup>University of California at Los Angeles, Electl. Eng. Dept. & California NanoSys. Inst. (CNSI), Los Angeles, CA 90095 USA
- I-4 **“Bio-MEMs: The Impact of MEMs on Biotechnology in the 21st Century”** *M. Madou*<sup>1</sup>; *C. Gurtner*<sup>1</sup>; <sup>1</sup>Nanogen, 10398 Pacific Ctr. Ct., San Diego, CA 92121 USA

## SESSION II.A. NITRIDE ELECTRONIC DEVICES

21-34

- II.A.-1 **“Submicron Enhancement-Mode AlGaIn/GaN HEMTs”** *J. S. Moon*<sup>1</sup>; *D. Wong*<sup>1</sup>; *T. Hussian*<sup>1</sup>; *M. Micovic*<sup>1</sup>; *P. Deelman*<sup>1</sup>; *M. Hu*<sup>1</sup>; *M. Antcliff*<sup>1</sup>; *C. Ngo*<sup>1</sup>; *P. Hashimoto*<sup>1</sup>; *L. McCray*<sup>1</sup>; <sup>1</sup>HRL Laboratories, LLC, 3011 Malibu Canyon Rd., Malibu, CA 90265 USA
- II.A.-2 **“p-GaN/AlGaIn/GaN High Electron Mobility Transistors”** *R. Coffie*<sup>1</sup>; *S. Heikman*<sup>1</sup>; *D. Buttari*<sup>1</sup>; *S. Keller*<sup>1</sup>; *A. Chini*<sup>1</sup>; *L. Shen*<sup>1</sup>; *N. Zhang*<sup>1</sup>; *A. Jimenez*<sup>1</sup>; *D. Jena*<sup>1</sup>; *U. K. Mishra*<sup>1</sup>; <sup>1</sup>University of California, Dept. of ECE, Santa Barbara, CA 93106 USA
- II.A.-3 **“3.2 W/mm, 71% PAE AlGaIn/GaN HEMT Operation at 20GHz”** *R. Sandhu*<sup>1</sup>; *M. Wojtkowicz*<sup>1</sup>; *I. Smorchkova*<sup>1</sup>; *M. Barsky*<sup>1</sup>; *R. Tsai*<sup>1</sup>; *J. W. Yang*<sup>2</sup>; *H. Wang*<sup>2</sup>; *M. A. Khan*<sup>2</sup>; <sup>1</sup>TRW, Elect. & Tech. Div., One Space Park, Redondo Beach, CA 90278 USA; <sup>2</sup>University of South Carolina, Dept. of Electl. Eng., Columbia, SC 29208 USA
- II.A.-4 **“p-Channel GaN/AlGaIn Heterostructure Junction Field Effect Transistor”** *A. Koudymov*<sup>1</sup>; *M. Shatalov*<sup>1</sup>; *G. Simin*<sup>1</sup>; *J. Zhang*<sup>1</sup>; *V. Adivarahan*<sup>1</sup>; *M. Asif Khan*<sup>1</sup>; <sup>1</sup>University of South Carolina, Dept. of Electl. Eng., Columbia, SC 29208 USA
- II.A.-5 **“AlGaIn/GaN Current Aperture Vertical Electron Transistors”** *I. Ben-Yaacov*<sup>1</sup>; *Y.-K. Seck*<sup>1</sup>; *S. Heikman*<sup>1</sup>; *S. P. DenBaars*<sup>1</sup>; *U. K. Mishra*<sup>1</sup>; <sup>1</sup>University of California, ECE Dept., Santa Barbara, CA 93106-9560 USA
- II.A.-6 **“AlGaIn/GaN HEMTs Grown by MBE on Semi-Insulating HVPE GaN Templates”** *N. G. Weiman*<sup>1</sup>; *M. J. Manfra*<sup>1</sup>; *J. W.P. Hsu*<sup>1</sup>; *L. N. Pfeiffer*<sup>1</sup>; *K. W. West*<sup>1</sup>; *D. V. Lang*<sup>2</sup>; *R. J. Molnar*<sup>3</sup>; <sup>1</sup>Lucent Technologies Bell Laboratories, Murray Hill, NJ 07974 USA; <sup>2</sup>Agere Systems, Murray Hill, NJ 07974 USA; <sup>3</sup>MIT Lincoln Labs, Lexington, MA 02420 USA

## SESSION II.B. SI-BASED DEVICES

35-54

- II.B.-1 **“Strained-Si- and SiGe-On-Insulator (Strained-SOI and SGOI) MOSFETs for High Performance/Low Power CMOS Application”** *S. Takagi*<sup>1</sup>; <sup>1</sup>MIRAI Project, MIRAI-ASET; Adv. LSI Tech. Lab., Toshiba Corp., 1 Komukai Toshibacho, Saiwai-ku, Kawasaki 210-8582 Japan
- II.B.-2 **“Performance-Augmented CMOS Using Back-End Uniaxial Strain”** *R. E. Belford*<sup>1</sup>; *W. Zhao*<sup>2</sup>; *J. Potashnik*<sup>2</sup>; *Q. Liu*<sup>2</sup>; *A. Seabaugh*<sup>2</sup>; <sup>1</sup>Belford Research Inc., Hilton Head, SC 29926 USA; <sup>2</sup>University of Notre Dame, Dept. of Electl. Eng., Notre Dame, IN 46556 USA
- II.B.-3 **“Electron Inversion Layer Mobility in Strained-Si *n*-MOSFETs with High Channel Doping Concentration Achieved by Ion Implantation”** *H. M. Nayfeh*<sup>1</sup>; *J. L. Hoyt*<sup>1</sup>; *C. W. Leitz*<sup>2</sup>; *A. J. Pitera*<sup>2</sup>; *E. A. Fitzgerald*<sup>2</sup>; *D. A. Antoniadis*<sup>1</sup>; <sup>1</sup>Massachusetts Institute of Technology, (Microsys. Tech. Lab.), 60 Vassar St., MIT 39-617, Cambridge, MA 02139 USA; <sup>2</sup>Massachusetts Institute of Technology, (Dept. of Matls. Sci. & Eng.), 60 Vassar St., Cambridge, MA 02139 USA
- II.B.-4 **“Nano-Scale Implantless Schottky-Barrier SOI FinFETs with Excellent Ambipolar Performance”** *H.-C. Lin*<sup>1</sup>; *M.-F. Wang*<sup>2</sup>; *F.-J. Hou*<sup>1</sup>; *J.-T. Liu*<sup>1</sup>; *F.-H. Ko*<sup>1</sup>; *H.-L. Chen*<sup>1</sup>; *G.-W. Huang*<sup>1</sup>; *T.-Y. Huang*<sup>1</sup>; *S. M. Sze*<sup>1</sup>; <sup>1</sup>National Nano Device Labs, 1001-1 Ta-Hsueh Rd, Hsin-Chu, Taiwan, China; <sup>2</sup>National Chiao-Tung University, Inst. of Elect., Hsin-Chu, Taiwan, China
- II.B.-5 **“Demonstration of FinFET CMOS Circuits”** *B. A. Rainey*<sup>1</sup>; *D. M. Fried*<sup>1</sup>; *M. Jeong*<sup>2</sup>; *J. Kedzierski*<sup>3</sup>; *E. J. Nowak*<sup>1</sup>; <sup>1</sup>IBM Microelectronics Division, Essex Junction, VT, USA; <sup>2</sup>IBM Semiconductor Research and Development Center, E. Fishkill, NY, USA; <sup>3</sup>IBM Research Division, Yorktown Heights, NY, USA
- II.B.-6 **“High Performance Sub-100nm Si Thin-Film Transistors by Pattern-Controlled Crystallization of Thin Channel Layer and High Temperature Annealing”** *J. Gu*<sup>1</sup>; *W. Wu*<sup>1</sup>; *S. Y. Chou*<sup>1</sup>; <sup>1</sup>Princeton University, NanoStructure Lab., Dept. of Electl. Eng., Princeton, NJ 08544 USA

- II.B.-7** “**Proposal of N-Channel Heterostructure Dynamic Threshold-Voltage MOSFET (HDTMOS) with P-Type Doped SiGe Body**” *T. Kawashima*<sup>1</sup>; T. Takagi<sup>1</sup>; Y. Hara<sup>1</sup>; Y. Kanzawa<sup>1</sup>; A. Inoue<sup>1</sup>; H. Sorada<sup>1</sup>; K. Nozawa<sup>1</sup>; A. Asai<sup>1</sup>; T. Ohnishi<sup>1</sup>; M. Kubo<sup>1</sup>; <sup>1</sup>Matsushita Electric Industrial Co., Ltd., Adv. Tech. Rsrch. Lab., 3-1-1, Yagumo-Nakamachi, Moriguchi, Osaka 570-8501 Japan
- II.B.-8** “**90 GHz F<sub>1</sub> SiGe HFET with Fully Optical Self-Aligned Sub-100nm Gate**” *M. Zeuner*<sup>1</sup>; A. Fox<sup>2</sup>; T. Hackbarth<sup>1</sup>; D. Behammer<sup>3</sup>; U. Konig<sup>1</sup>; <sup>1</sup>Daimler Chrysler Research Center Ulm, Wilhelm-Runge-Str. 11, D-89081 Ulm, Germany; <sup>2</sup>IHP, Im Technologiepark 25, D-15236 Frankfurt(Oder); <sup>3</sup>United Monolithic Semiconductors GmbH, Wilhelm-Runge-Str. 11, Ulm D-89081 Germany

### SESSION III. POSTER SESSION

55–110

- III.-1** “**Reliability and ESD for High Voltage LDMOS with SenseFET**” *Y. S. Choi*<sup>1</sup>; J. J. Kim<sup>1</sup>; C. K. Jeon<sup>1</sup>; M. H. Kim<sup>1</sup>; S. L. Kim<sup>1</sup>; H. S. Kang<sup>1</sup>; C. S. Song<sup>1</sup>; <sup>1</sup>Fairchild Semiconductor, 82-3, Dodang-Dong, Wonmi-Ku, Puchon, Kyonggi-Do 420-711 Korea
- III.-2** “**A Novel Variational Approach for Modeling Sub-0.1 Micron MOS Devices Including Quantum Mechanical Interface Charge Confinement Effects**” *N. G. Gunther*<sup>1</sup>; A. A. Mutlu<sup>1</sup>; M. Rahman<sup>1</sup>; <sup>1</sup>Santa Clara University, Dept. of Electl. Eng., 500 El Camino Real, Santa Clara, CA 95053-0569 USA
- III.-3** “**Nickel Induced Crystallization of a-Si Gate Electrode at 500°C and Gate Oxide Reliability**” *A. R. Joshi*<sup>1</sup>; K. C. Saraswat<sup>1</sup>; <sup>1</sup>Stanford University, CIS 006, 420 Via Ortega, Stanford, CA 94305-4070 USA
- III.-4** “**Stable Breakdown Characteristics of 600V LDMOS by Extended P-Bottom Region**” *S. L. Kim*<sup>1</sup>; C. K. Jeon<sup>1</sup>; J. J. Kim<sup>1</sup>; Y. S. Choi<sup>1</sup>; M. H. Kim<sup>1</sup>; H. S. Kang<sup>1</sup>; C. S. Song<sup>1</sup>; <sup>1</sup>Fairchild Semiconductor, New Tech. Dvpt. Team, 82-3 Dodang-Dong, Wonmi-Ku, Puchon, Kyonggi-Do 420-711 Korea
- III.-5** “**Symmetry Realization of BSIM Model with Dynamic Reference Method for Circuit Simulation**” *X. Xi*<sup>1</sup>; K. Cao<sup>1</sup>; J. He<sup>1</sup>; H. Wan<sup>1</sup>; M. Chan<sup>1</sup>; C. Hu<sup>1</sup>; <sup>1</sup>University of California, Dept. of Electl. Eng. & Compu. Sci., Berkeley, CA 94720 USA
- III.-6** “**Newly Designed Isolated RESURF LDMOS Transistor for 60V BCD Process Provides 20V Vertical NPN Transistor**” *T. H. Kwon*<sup>1</sup>; Y. S. Jeoung<sup>1</sup>; S. K. Lee<sup>1</sup>; Y. C. Choi<sup>1</sup>; C. J. Kim<sup>1</sup>; H. S. Kang<sup>1</sup>; C. S. Song<sup>1</sup>; <sup>1</sup>Fairchild Korea Semiconductor Process Development Group, 82-3, Dodang-Dong, Wonmi-Ku, Puchon, Kyunggi-Do, Korea
- III.-7** “**High Performance 40-GHz Bandpass Filters on Si Using Proton Implantation**” *K. T. Chan*<sup>1</sup>; C. Y. Chen<sup>1</sup>; A. Chin<sup>1</sup>; J. C. Hsieh<sup>2</sup>; J. Liu<sup>2</sup>; T. S. Duh<sup>3</sup>; W. J. Lin<sup>3</sup>; <sup>1</sup>National Chiao Tung University, Dept. of Elect. Eng., Hsinchu, Taiwan; <sup>2</sup>United Microelectronics Cooperation, Hsinchu, Taiwan; <sup>3</sup>Institute of Nuclear Energy Research, Taoyuan, Taiwan
- III.-8** “**RF Noise in Deep Sub- $\mu$ m MOSFETs and Proposed Solution**” *C. H. Huang*<sup>1</sup>; C. H. Lai<sup>1</sup>; J. C. Hsieh<sup>2</sup>; J. Liu<sup>2</sup>; A. Chin<sup>1</sup>; <sup>1</sup>National Chiao Tung University, Dept. of Elect. Eng., Hsinchu, Taiwan; <sup>2</sup>United Microelectronics Cooperation, Hsinchu, Taiwan
- III.-9** “**An Enhanced Compact Waffle MOSFET for RF Integrated Circuits**” *S. Lam*<sup>1</sup>; W. H. Ki<sup>1</sup>; P. K. Ko<sup>1</sup>; M. Chan<sup>1</sup>; <sup>1</sup>Hong Kong University of Science & Technology, Dept. of Electl. & Elect. Eng., Hong Kong
- III.-10** “**Improved MOSFET Electron Mobility for Advanced Gate Dielectric Stacks**” *I. Polishchuk*<sup>1</sup>; K. J. Yang<sup>1</sup>; T.-J. King<sup>1</sup>; C. Hu<sup>1</sup>; <sup>1</sup>University of California, Dept. of Electl. Eng. & Compu. Scis., Berkeley, CA 94720 USA
- III.-11** “**Speed Advantage of Optimized Metal S/D in 25 nm Dual-Gate Fully-Depleted CMOS**” *D. Connelly*<sup>1</sup>; D. Grupp<sup>1</sup>; D. Yergeau<sup>2</sup>; <sup>1</sup>Acorn Technologies; <sup>2</sup>Stanford University, CA, USA
- III.-12** “**Normal Incidence Long-Wave Infrared InAs/In<sub>0.15</sub>Ga<sub>0.85</sub>As DWELL Detectors Operating at 8.2 $\mu$ m**” *S. Krishna*<sup>1</sup>; S. Raghavan<sup>1</sup>; B. Fuchs<sup>1</sup>; A. Stintz<sup>1</sup>; K. Malloy<sup>1</sup>; C. Morath<sup>2</sup>; D. Le<sup>2</sup>; D. A. Cardimona<sup>2</sup>; <sup>1</sup>University of New Mexico, Ctr. for High Tech. Matls., EECE Dept., Albuquerque, NM 87106 USA; <sup>2</sup>Air Force Research Lab (AFRL/VSSS) 3550 Aberdeen Ave. S.E., Bldg. 426, Kirtland AFB, NM 87117 USA
- III.-13** “**High Luminous Flux Mirror-Substrate AlGaInP Large-Area Emitters**” *R. H. Horng*<sup>1</sup>; D. S. Wu<sup>2</sup>; S. H. Huang<sup>1</sup>; C. R. Chung<sup>3</sup>; <sup>1</sup>National Chung Hsing University, Inst. of Precision Eng., Taichung 402, Taiwan; <sup>2</sup>National Chung Hsing University, Dept. of Matls. Eng., Taichung 402, Taiwan; <sup>3</sup>Da-Yeh University, Inst. of Electl. Eng., Chang-Hwa 515 Taiwan
- III.-14** “**SiGe-Channel 0.1- $\mu$ m pMOSFETs with Super Self-Aligned Ultra-Shallow Junction Formed by Selective In-Situ B-Doped SiGe CVD**” *D. Lee*<sup>1</sup>; M. Sakuraba<sup>1</sup>; T. Matsuura<sup>1</sup>; J. Murota<sup>1</sup>; T. Tsuchiya<sup>2</sup>; <sup>1</sup>Tohoku University, Lab. for Elect. Intelligent Sys., Res. Inst. of Elect. Comm., 2-1-1 Katahira, Aoba-ku, Sendai 980-8577 Japan; <sup>2</sup>Shimane University, Interdisciplinary Fac. of Sci. & Eng., 1060 Nishikawatsu, Matsue Shimane 690-8504 Japan
- III.-15** “**Multiple Delta-Doped Layer Structures for Silicon Power MOSFETs**” *C. Tolksdorf*<sup>1</sup>; J. Schulze<sup>1</sup>; T. Sulima<sup>1</sup>; I. Eisele<sup>1</sup>; G. Deboy<sup>2</sup>; <sup>1</sup>Universitat der Bundeswehr Munich, Inst. of Physics, Fac. EE & IT, Werner-Heisenberg-Weg 39, Neubiberg 85577 Germany; <sup>2</sup>Infineon Technologies AG Munich, Balanstrasse 73, Munchen 81541 Germany

- III-16** “GaAs Schottky Varactor Diode Optimization for High-Performance Nonlinear Transmission Lines” *D. Sawdai*<sup>1</sup>; D. Ko<sup>1</sup>; M. Kintis<sup>1</sup>; S. Maas<sup>2</sup>; X. Zhang<sup>1</sup>; S. Valdes<sup>1</sup>; E. Garber<sup>1</sup>; G. Barber<sup>1</sup>; E. Quach<sup>1</sup>; J. Newman<sup>1</sup>; F. Fong<sup>1</sup>; <sup>1</sup>TRW, Inc., Space & Elect. Grp., One Space Park, D1/1302, Redondo Beach, CA 90278 USA; <sup>2</sup>Nonlinear Technologies, Inc.
- III-17** “A Novel Horizontal Current Bipolar Transistor (HCBT) for Vertical BiCMOS Integration” T. Suligoj<sup>1</sup>; P. Biljanovic<sup>2</sup>; K. L. Wang<sup>1</sup>; <sup>1</sup>University of California at Los Angeles, Device Rsrch. Lab., Dept. of Electl. Eng., Los Angeles, CA 90095 USA; <sup>2</sup>University of Zagreb, Fac. of Electl. Eng. & Computing, Unska3, Zagreb HR-10000 Croatia
- III-18** “The Effect of Scattering on Drive Current of Nanotransistors” *A. Svizhenko*<sup>1</sup>; M. P. Anantram<sup>1</sup>; <sup>1</sup>NASA Ames Research Center, MS T27A-1, Moffett Field, CA 94035-1000 USA
- III-19** “Optoelectronic Conversion through 850nm Band Single Mode Si<sub>3</sub>N<sub>4</sub> Photonic Waveguides for Si-On-Chip Integration” *T. Matsuura*<sup>1</sup>; A. Yamada<sup>1</sup>; J. Murota<sup>1</sup>; E. Tamechika<sup>2</sup>; K. Wada<sup>3</sup>; L. C. Kimerling<sup>3</sup>; <sup>1</sup>RIEC Tohoku University, Katahira, Aobaku, Sendai 980-8577, Japan; <sup>2</sup>NTT Photonics Laboratories, Atsugi 243-0198; <sup>3</sup>MIT, Microphotonics Ctr., MA 02139 USA
- III-20** “InP Hot Electron Transistor with a Buried Metallic Gate for Electron Emission” *Y. Miyamoto*<sup>1</sup>; R. Yamamoto<sup>1</sup>; H. Maeda<sup>1</sup>; K. Takeuchi<sup>1</sup>; L.-E. Wernersson<sup>2</sup>; K. Furuya<sup>1</sup>; <sup>1</sup>Tokyo Institute of Technology, Dept. of Electl. & Elect. Eng., 2-12-1 Ookayama, Meguru-ku, Tokyo 152-8552, Japan; <sup>2</sup>Lund University, Solid State Physics/Nanometer Structure Consortium, Box 118, Lund S-22100 Sweden
- III-21** “Memory Device Based on a Ferroelectric Tunnel Junction” *J. Rodriguez Contreras*<sup>1,3</sup>; J. Schubert<sup>2</sup>; H. Kohlstedt<sup>1</sup>; R. Waser<sup>1</sup>; <sup>1</sup>Institut für Festkörperforschung, Forschungszentrum Julich, 52425 Julich, Germany; <sup>2</sup>Institut für Schichten und Grenzflächen, Forschungszentrum Julich, 52425 Julich, Germany; <sup>3</sup>Present address: The Pennsylvania State University, 128 MRI Bldg., Rsrch. Park, University Park, PA 16803 USA
- III-22** “Thermal Management and Device Failure Assessment of High-Power AlGaIn/GaN HFETs” *M. Kuball*<sup>1</sup>; S. Rajasingam<sup>1</sup>; A. Sarua<sup>1</sup>; J. M. Hayes<sup>1</sup>; M. J. Uren<sup>2</sup>; T. Martin<sup>2</sup>; R. S. Balmer<sup>2</sup>; B. T. Hughes<sup>2</sup>; K. P. Hilton<sup>2</sup>; <sup>1</sup>University of Bristol, H. H. Wills Physics Lab., Bristol BS8 1TL, UK; <sup>2</sup>QinetiQ Ltd., St. Andrew’s Rd., Malvern, Worcs WR14 3PS UK
- III-23** “Room Temperature Grown Zirconia/SiO<sub>2</sub> Dielectric Stacks with 1 nm EOT” *S. Ramanathan*<sup>1</sup>; P. C. McIntyre<sup>1</sup>; <sup>1</sup>Dept. of Matls. Sci. & Eng., Stanford University, Stanford, CA 94305 USA
- III-24** “Graph-Based Quantum Integrated Circuits Using III-V Multi-Branch Nanowire Networks and their Nano-Schottky Gate Control” S. Kasai<sup>1</sup>; M. Yumoto<sup>1</sup>; T. Fukushi<sup>1</sup>; T. Muranaka<sup>1</sup>; H. Hasegawa<sup>1</sup>; <sup>1</sup>Hokkaido University, Rsrch. Ctr. for Integrated Quantum Elect. & Grad. Sch. of Elect. & Info. Eng., N-13, W-8, Kita-ku, Sapporo 060-8628 Japan
- III-25** “Tunneling through Multi-Layer Gate Dielectrics-An Analytical Model” *I. Polishchuk*<sup>1</sup>; Y.-C. Yeo<sup>1</sup>; T.-J. King<sup>1</sup>; C. Hu<sup>1</sup>; <sup>1</sup>University of California, Dept. of EECS, Berkeley, CA 94720 USA
- III-26** “Ultra High Fmax InP/InGaAs/InP Transferred Substrate DHBTs” *S. Lee*<sup>1</sup>; M. Urteaga<sup>1</sup>; Y. Wei<sup>1</sup>; Y. Kim<sup>1</sup>; M. Dahlström<sup>1</sup>; S. Krishnan<sup>1</sup>; M. Rodwell<sup>1</sup>; <sup>1</sup>University of California, Dept. of ECE, Santa Barbara, CA 93106 USA
- III-27** “Simulation of Quantum and Scattering Effects Along the Channel of Ultra-Scaled Si-Based MOSFETs” *W. Chen*<sup>1</sup>; L. F. Register<sup>1</sup>; S. K. Banerjee<sup>1</sup>; <sup>1</sup>University of Texas at Austin, Microelect. Rsrch. Ctr., R9950, Austin, TX 78758 USA

## SESSION IV. EMERGING TECHNOLOGIES

111–132

- IV-1** “Hybrid-Gate Suspended Field-Effect Transistors for Gas Sensing” *I. Eisele*<sup>1</sup>; M. Zimmer<sup>1</sup>; <sup>1</sup>Universität der Bundeswehr München, Inst. of Physics, Fac. of Electl. Eng. & Info. Tech., Neubiberg 85577 Germany
- IV-2** “Manipulation of Ferromagnetism in Magnetic Semiconductor Field Effect Transistors” *H. Ohno*<sup>1</sup>; <sup>1</sup>Tohoku University, Rsrch. Inst. of Electl. Comm., Katahira 2-1-1, Aoba-ku, Sendai 980-8577 Japan
- IV-3** “Molecular-Scale Transistors Based on Self-Assembled Monolayers” *J. H. Schön*<sup>1</sup>; <sup>1</sup>Bell Laboratories, Lucent Technologies, 600 Mountain Ave., Murray Hill, NJ 07974 USA
- IV-4** “Designing In-Vitro Patterned Neuronal Network” *B. C. Wheeler*<sup>1</sup>; <sup>1</sup>University of Illinois at Urbana-Champaign, Electl. & Compu. Eng. Dept. & Beckman Inst., 405 N. Mathews Ave., Urbana, IL 61801 USA
- IV-5** “Structured Cold Point Thermoelectric Coolers” *U. Goshal*<sup>1</sup>; <sup>1</sup>Austin Research Laboratory, IBM Research, 11400 Burnet Rd., Austin, TX 78758 USA
- IV-6** “The Second Revolution—Mixed-Technology Integrated Microsystems” *T. E. Zipperian*<sup>1</sup>; <sup>1</sup>Sandia National Laboratories, Microsys. Sci., Tech. & Components, PO Box 5800, Albuquerque, NM 87185-1077 USA

- VA.-1** “Quantum Dot Lasers: Temperature Insensitive Operation and the Prospect for High Speed Modulation” *D. G. Deppe*<sup>1</sup>; O. B. Shchekin<sup>1</sup>; <sup>1</sup>University of Texas at Austin, Microelect. Rsrch. Ctr., Austin, TX 78712 USA
- VA.-2** “Quantum Dot Tunnel Injection Lasers with Large Modulation Bandwidth at Room Temperature” *S. Ghosh*<sup>1</sup>, P. Bhattacharya<sup>1</sup>; Z-K. Wu<sup>1</sup>; T. Norris<sup>1</sup>; J. Singh<sup>1</sup>; B. Kochman<sup>1</sup>; <sup>1</sup>University of Michigan, Dept. of Elect. Eng. & Compu. Sci., Ann Arbor, MI 48109-2122 USA
- VA.-3** “A 1.5  $\mu\text{m}$  GaInNAs(Sb) Laser Grown on GaAs by MBE” *W. Ha*<sup>1</sup>; V. Gambin<sup>1</sup>; S. Bank<sup>1</sup>; M. Wistey<sup>1</sup>; H. Yuen<sup>1</sup>; S. Kim<sup>1</sup>; J. S. Harris, Jr.<sup>1</sup>; <sup>1</sup>Stanford University, Solid State & Photonics Lab., CISX B113-3, Via Ortega, Stanford, CA 94305 USA
- VA.-4** “Technology and Performance of Submicron Metal-Semiconductor-Metal GaN Ultraviolet Detectors” *T. Palacios*<sup>1</sup>; E. Monroy<sup>1,2</sup>; F. Calle<sup>1</sup>; F. Omnes<sup>3</sup>; <sup>1</sup>Universidad Politecnica de Madrid, ISOM & Dpto. Ingenieria Electronica, ETSI de Telecomunicacion, Ciudad Universitaria, s/n 28040 Madrid, Spain; <sup>2</sup>CEA, Dept. De Recherche Fondamentale sur la Matiere Condensee, Grenoble Cedex 9, 38054 France; <sup>3</sup>Centre de Recherche sur l’Hetero-Epitaxie et ses Applications, CNRS, Valbonne 06560 France
- VA.-5** “GaAlAs/GaAs Micromachined Tunable Vertical Filter with Low Tuning Voltage Below 5 Volts” *T. Amano*<sup>1</sup>; F. Koyama<sup>1</sup>; T. Hino<sup>1</sup>; M. Arai<sup>1</sup>; A. Matsutani<sup>1</sup>; <sup>1</sup>Tokyo Institute of Technology, Microsys. Rsrch. Ctr., Precision & Intelligence Lab., 4259 Nagatsuta, Midori-ku, Yokohama 226-8503 Japan
- VA.-6** “Polymer LEDs and LASERs for Integrated Optics (Invited)” *M. D. McGehee*<sup>1</sup>; <sup>1</sup>Stanford University, Dept. of Matls. Sci. & Eng., Bldg. 550, Stanford, CA 94305 USA

- VB.-1** “Contact Printing with Nanometer Resolution” *Y. L. Loo*<sup>1</sup>; R. L. Willett<sup>1</sup>; K. W. Baldwin<sup>1</sup>; J. A. Rogers<sup>1</sup>; <sup>1</sup>Bell Laboratories, Lucent Technologies, 600 Mountain Ave., Murray Hill, NJ 07974 USA
- VB.-2** “Charge Retention Characteristics of SiGe Quantum Dot Flash Memories” *D.-W. Kim*<sup>1</sup>; F. E. Prins<sup>1</sup>; T. Kim<sup>1</sup>; D.-L. Kwong<sup>1</sup>; S. Banerjee<sup>1</sup>; <sup>1</sup>University of Texas at Austin, Microelect. Rsrch. Ctr., Austin, TX 78712 USA
- VB.-3** “Multilayer Tunneling Barriers for Nonvolatile Memory Applications” *P. Blomme*<sup>1,2</sup>; B. Govoreanu<sup>1,2</sup>; M. Rosmeulen<sup>1,2</sup>; J. Van Houdt<sup>1</sup>; K. DeMeyer<sup>1,2</sup>; <sup>1</sup>IMEC, STDI Div., Kapeldreef 75, 3001 Leuven, Belgium; <sup>2</sup>ESAT, KU Leuven, Kasteelpark Arenberg 10, Leuven 3001 Belgium
- VB.-4** “A Resonant Tunneling Permeable Base Transistor with Al-Free Tunneling Barriers” *E. Lindstrom*<sup>1</sup>; I. Pietzonka<sup>1</sup>; W. Seifert<sup>1</sup>; L. E. Wernersson<sup>1</sup>; <sup>1</sup>Lund University, Solid State Physics/Nanometer Consortium, Box 118, S-22100 Sweden
- VB.-5** “Room Temperature Negative Differential Resistance in AlN/GaN Double Barrier Resonant Tunneling Diodes Grown by RF-Plasma Assisted Molecular Beam Epitaxy” *A. Kikuchi*<sup>1</sup>; R. Bannai<sup>1</sup>; K. Kishino<sup>1</sup>; <sup>1</sup>Sophia University, Electl. & Elect. Eng., 7-1, Kioi-cho, Chiyoda-ku, Tokyo 102-8554 Japan
- VB.-6** “A Novel Frequency-Doubling Device Based on Three-Terminal Ballistic Junction” *I. Shorubalko*<sup>1</sup>; H. Q. Xu<sup>1</sup>; I. Maximov<sup>1</sup>; D. Nilsson<sup>1</sup>; P. Omling<sup>1</sup>; L. Samuelson<sup>1</sup>; W. Seifert<sup>1</sup>; <sup>1</sup>Lund University, Solid State Physics & the Nanometer Consortium, Box 118, Lund SE-22100 Sweden

- VI.A.-1** “InP-Based HEMTs with a Cutoff Frequency Higher than 450 Ghz” *K. Shinohara*<sup>1</sup>; Y. Yamashita<sup>2</sup>; A. Endoh<sup>2</sup>; K. Hikosaka<sup>2</sup>; T. Matsui<sup>1</sup>; T. Mimura<sup>2</sup>; S. Hiyamizu<sup>3</sup>; <sup>1</sup>Communications Research Laboratory, 4-2-1 Nukui-kitamachi, Koganei, Tokyo 184-8795, Japan; <sup>2</sup>Fujitsu Laboratories, Ltd, Kanagawa, Japan; <sup>3</sup>Osaka University, Osaka, Japan
- VI.A.-2** “Suppression of Drain Conductance Frequency Dispersion in InP-Based HEMTs by Eliminating Hole Accumulation” *T. Arai*<sup>1</sup>; K. Sawada<sup>1</sup>; N. Okamoto<sup>1</sup>; K. Makiyama<sup>1</sup>; T. Takahashi<sup>1</sup>; N. Hara<sup>1</sup>; <sup>1</sup>Fujitsu Laboratories, Ltd., 10-1 Morinosato-Wakamiya, Atsugi, Kanagawa 243-0197 Japan
- VI.A.-3** “Thermal Performance of Metamorphic Double Heterojunction Bipolar Transistors with InP and InAlP Buffer Layers” *Y. M. Kim*<sup>1</sup>; M. Dahlström<sup>1</sup>; M. J.W. Rodwell<sup>1</sup>; A. C. Gossard<sup>1</sup>; <sup>1</sup>University of California, Dept. of ECE, Santa Barbara, CA 93106 USA
- VI.A.-4** “InAlAs/InGaAs/InP DHBTs with Polycrystalline InAs Extrinsic Emitter Regrowth” *D. Scott*<sup>1</sup>; H. Xing<sup>1</sup>; S. Krishnan<sup>1</sup>; M. Urteaga<sup>1</sup>; N. Parthasarathy<sup>1</sup>; M. Rodwell<sup>1</sup>; <sup>1</sup>University of California, Dept. of ECE, Santa Barbara, CA 93106 USA

- VII.A.-1 “High Power Hybrid and MMIC Amplifiers using Wide-Bandgap Semiconductor Devices on Semi-Insulating SiC Substrates”** *S. T. Sheppard*<sup>1</sup>; R. P. Smith<sup>1</sup>; W. L. Pribble<sup>1</sup>; Z. Ring<sup>1</sup>; T. Smith<sup>1</sup>; S. T. Allen<sup>1</sup>; J. Milligan<sup>1</sup>; J. W. Palmour<sup>1</sup>; <sup>1</sup>Cree, Inc., 4600 Silicon Dr., Durham, NC 27703 USA
- VII.A.-2 “A Silicon Carbide Self-Aligned and Ion Implanted Static Induction Transistor (SAI-SIT) for 150 Watt S-Band Operation”** *T. J. Knight*<sup>1</sup>; R. C. Clarke<sup>1</sup>; R. R. Barron<sup>1</sup>; J. A. Ostop<sup>1</sup>; B. A. Morick<sup>1</sup>; J. R. Gigante<sup>1</sup>; W. J. Malkowski<sup>1</sup>; A. W. Morse<sup>1</sup>; G. C. DeSalvo<sup>1</sup>; K. J. Petrosky<sup>1</sup>; W. R. Curtice<sup>2</sup>; <sup>1</sup>Northrup Grumman Corporation, Baltimore, MD 21090 USA; <sup>2</sup>W. R. Curtice Consulting, Washington Crossing, PA 18977 USA
- VII.A.-3 “First Diamond FET RF Power Measurement on Diamond Quasi-Substrate”** A. Aleksov<sup>1</sup>; M. Kubovic<sup>1</sup>; N. Kaeb<sup>1</sup>; U. Spitzberg<sup>1</sup>; I. Daumiller<sup>1</sup>; Th. Bauer<sup>2</sup>; M. Schreck<sup>2</sup>; B. Stritzker<sup>2</sup>; E. Kohn<sup>1</sup>; <sup>1</sup>University of Ulm, Dept. of Electron Devices & Circuits, Albert-Einstaein-Allee 45, Ulm D-89081 Germany; <sup>2</sup>Universitaet Augsburg, Inst. fuer Physik, Augsburg D-86135 Germany
- VII.A.-4 “4H-SiC Power Bioplar Transistors with Common Emitter Current Gain > 50”** *C.-F. Huang*<sup>1</sup>; J. A. Cooper, Jr.<sup>1</sup>; <sup>1</sup>Purdue University, Sch. of ECE, W. Lafayette, IN 47907-1285 USA
- VII.A.-5 “Self-Aligned Extended-Drain with Compensating Ion-Implantation for Extended-SOA in 30V Lateral MOS”** *S. K. Lee*<sup>1</sup>; C. J. Kim<sup>1</sup>; Y. C. Choi<sup>1</sup>; T. H. Kwon<sup>1</sup>; Y. S. Jung<sup>1</sup>; H. S. Kang<sup>1</sup>; C. S. Song<sup>1</sup>; <sup>1</sup>Fairchild Korea Semiconductor Process Development Group, 82-3, Dodang-Dong, Wonmi-Ku, Puchon, Kyunggi-Do, Korea

- VII.B.-1 “Direct Evidence for Multiple Vibrational Excitation of Si-H/D Bonds for Hot-Carrier Degradation of MOS Transistors”** *Z. Chen*<sup>1</sup>; P. Ong<sup>1</sup>; <sup>1</sup>University of Kentucky, Dept. of Electl. & Compu. Eng. & Ctr. for Micro-Magnetic & Elect. Devices, Lexington, KY 40506 USA
- VII.B.-2 “Ultrathin High-K Gate Dielectric Technology for Germanium MOS Applications”** *C. O. Chui*<sup>1</sup>; S. Ramanathan<sup>2</sup>; B. B. Triplett<sup>2</sup>; P. C. McIntyre<sup>2</sup>; K. C. Saraswat<sup>1</sup>; <sup>1</sup>Stanford University, Dept. of Electl. Eng., Stanford, CA 94305 USA; <sup>2</sup>Stanford University, Dept. of Matls. Sci. & Eng., Stanford, CA 94305 USA
- VII.B.-3 “High Quality MOSFETs Fabrication with HfO<sub>2</sub> Gate Dielectric and TaN Gate Electrode”** *R. Choi*<sup>1</sup>; K. Onishi<sup>1</sup>; C. S. Kang<sup>1</sup>; R. Nieh<sup>1</sup>; S. Gopalan<sup>1</sup>; H.-J. Cho<sup>1</sup>; S. Krishnan<sup>1</sup>; J. C. Lee<sup>1</sup>; <sup>1</sup>The University of Texas at Austin, Microelect. Rsrch. Ctr., R9950, Dept. of Electl. & Computer Eng., Austin, TX 78758 USA
- VII.B.-4 “Impact of NH<sub>3</sub> Pre-Treatment on the Electrical and Reliability Characteristics of Ultra Thin Hafnium Silicate Films Prepared by Re-Oxidation Method”** *S. Gopalan*<sup>1</sup>; R. Choi<sup>1</sup>; K. Onishi<sup>1</sup>; R. Nieh<sup>1</sup>; C. S. Kang<sup>1</sup>; H.-J. Cho<sup>1</sup>; S. Krishnan<sup>1</sup>; J. C. Lee<sup>1</sup>; <sup>1</sup>University of Texas at Austin, Microelect. Rsrch. Ctr., MC R9950, Austin, TX 78758 USA
- VII.B.-5 “A Comparative Study of RF Noise Characteristics of Different Submicron SOI MOSFET Structures on SIMOX Technology”** *S. Lam*<sup>1</sup>; H. Wang<sup>1</sup>; W.-K. Lee<sup>1</sup>; P. K. Ko<sup>1</sup>; M. Chan<sup>1</sup>; <sup>1</sup>Hong Kong University of Science & Technology, Dept. of Electl. & Elect. Eng., Hong Kong

# Plenary Session

**MONDAY AM, JUNE 24TH, 2002**

*Session Organizer:* Sanjay Banerjee, The University of Texas at Austin

*Session Chair:* Jeffrey Welser, IBM Microelectronics

**8:30 AM, Welcoming Remarks**

**Presentations: IEEE Fellows and Best Student Paper Award**

**9:00 AM, I-1 Plenary**

**From Electron Tubes to Nanostructures: 60 Years of Electron Device Research:** *H. Kroemer*<sup>1</sup>; <sup>1</sup>University of California at Santa Barbara, Dept. of Electl. & Compu. Eng., & Dept. of Matls., Santa Barbara, CA 93106 USA

**9:50 AM Break**

## Special MEMS Session

**10:15 AM I-2 Invited**

**RF MEMs for Wireless Applications:** *C. T.-C. Nguyen*<sup>1</sup>; <sup>1</sup>University of Michigan, Ctr. for Wireless Microsys., Ann Arbor, MI 48109 USA

**10:45 AM I-3 Invited**

**Advanced MEMs for Photonics:** *M. C. Wu*<sup>1</sup>; *P. R. Patterson*<sup>1</sup>; *D. Hah*<sup>1</sup>; *M. C.M. Lee*<sup>1</sup>; *S. Huang*<sup>1</sup>; *J.-C. Tsai*<sup>1</sup>; <sup>1</sup>University of California at Los Angeles, Electl. Eng. Dept. & California NanoSystem Inst. (CNSI), Los Angeles, CA 90095 USA

**11:15 AM I-4 Invited**

**Bio-MEMs: The Impact of MEMs on Biotechnology in the 21st Century:** *M. Madou*<sup>1</sup>; *C. Gurtner*<sup>1</sup>; <sup>1</sup>Nanogen, 10398 Pacific Ctr. Ct., San Diego, CA 92121 USA

## Nitride Electronic Devices

MONDAY PM, JUNE 24TH, 2002

*Session Organizer:* Bobby Brar, Rockwell Scientific Company

*Session Chair:* Chanh Nguyen, GCS Corp

### 1:40 PM II.A-1

**Submicron Enhancement-Mode AlGaIn/GaN HEMTs:** *J. S. Moon*<sup>1</sup>; D. Wong<sup>1</sup>; T. Hussian<sup>1</sup>; M. Micovic<sup>1</sup>; P. Deelman<sup>1</sup>; M. Hu<sup>1</sup>; M. Antcliffe<sup>1</sup>; C. Ngo<sup>1</sup>; P. Hashimoto<sup>1</sup>; L. McCray<sup>1</sup>; <sup>1</sup>HRL Laboratories, LLC, 3011 Malibu Canyon Rd., Malibu, CA 90265 USA

### 2:00 PM II.A-2

**p-GaN/AlGaIn/GaN High Electron Mobility Transistors:** *R. Coffie*<sup>1</sup>; S. Heikman<sup>1</sup>; D. Buttari<sup>1</sup>; S. Keller<sup>1</sup>; A. Chini<sup>1</sup>; L. Shen<sup>1</sup>; N. Zhang<sup>1</sup>; A. Jimenez<sup>1</sup>; D. Jena<sup>1</sup>; U. K. Mishra<sup>1</sup>; <sup>1</sup>University of California, Dept. of ECE, Santa Barbara, CA 93106 USA

### 2:20 PM II.A-3

**3.2 W/mm, 71% PAE AlGaIn/GaN HEMT Operation at 20GHz:** *R. Sandhu*<sup>1</sup>; M. Wojtkowicz<sup>1</sup>; I. Smorchkova<sup>1</sup>; M. Barsky<sup>1</sup>; R. Tsai<sup>1</sup>; J. W. Yang<sup>2</sup>; H. Wang<sup>2</sup>; M. A. Khan<sup>2</sup>; <sup>1</sup>TRW, Elect. & Tech. Div., One Space Park, Redondo Beach, CA 90278 USA; <sup>2</sup>University of South Carolina, Dept. of Electl. Eng., Columbia, SC 29208 USA

### 2:40 PM II.A-4

**p-Channel GaN/AlGaIn Heterostructure Junction Field Effect Transistor:** *A. Koudymov*<sup>1</sup>; M. Shatalov<sup>1</sup>; G. Simin<sup>1</sup>; J. Zhang<sup>1</sup>; V. Adivarahan<sup>1</sup>; M. Asif Khan<sup>1</sup>; <sup>1</sup>University of South Carolina, Dept. of Electl. Eng., Columbia, SC 29208 USA

### 3:00 PM Break

### 3:20 PM II.A-5

**AlGaIn/GaN Current Aperture Vertical Electron Transistors:** *I. Ben-Yaacov*<sup>1</sup>; Y.-K. Seck<sup>1</sup>; S. Heikman<sup>1</sup>; S. P. DenBaars<sup>1</sup>; U. K. Mishra<sup>1</sup>; <sup>1</sup>University of California, ECE Dept., Santa Barbara, CA 93106-9560 USA

### 3:40 PM II.A-6

**AlGaIn/GaN HEMTs Grown by MBE on Semi-Insulating HVPE GaN Templates:** *N. G. Weiman*<sup>1</sup>; M. J. Manfra<sup>1</sup>; J. W.P. Hsu<sup>1</sup>; L. N. Pfeiffer<sup>1</sup>; K. W. West<sup>1</sup>; D. V. Lang<sup>2</sup>; R. J. Molnar<sup>3</sup>; <sup>1</sup>Lucent Technologies Bell Laboratories, Murray Hill, NJ 07974 USA; <sup>2</sup>Agere Systems, Murray Hill, NJ 07974 USA; <sup>3</sup>MIT Lincoln Labs, Lexington, MA 02420 USA



## Si-Based Devices

MONDAY PM, JUNE 24TH, 2002

*Session Organizer:* Ed Nowak, IBM Microelectronics

*Session Chair:* David Fried, Cornell University

### 1:30 PM II.B-1 Invited

**Strained-Si- and SiGe-On-Insulator (Strained-SOI and SGOI) MOSFETs for High Performance/Low Power CMOS Application:** *S. Takagi*<sup>1</sup>; <sup>1</sup>Toshiba Corporation, MIRAI Project, MIRAI-ASET; Adv. LSI Tech. Lab., 1 Komukai Toshiba-cho, Saiwai-ku, Kawasaki 210-8582 Japan

### 2:00 PM II.B-2

**Performance-Augmented CMOS Using Back-End Uniaxial Strain:** *R. E. Belford*<sup>1</sup>; *W. Zhao*<sup>2</sup>; *J. Potashnik*<sup>2</sup>; *Q. Liu*<sup>2</sup>; *A. Seabaugh*<sup>2</sup>; <sup>1</sup>Belford Research, Inc., Hilton Head, SC 29926 USA; <sup>2</sup>University of Notre Dame, Dept. of Electl. Eng., Notre Dame, IN 46556 USA

### 2:20 PM II.B-3

**Electron Inversion Layer Mobility in Strained-Si *n*-MOSFETs with High Channel Doping Concentration Achieved by Ion Implantation:** *H. M. Nayfeh*<sup>1</sup>; *J. L. Hoyt*<sup>1</sup>; *C. W. Leitz*<sup>2</sup>; *A. J. Pitera*<sup>2</sup>; *E. A. Fitzgerald*<sup>2</sup>; *D. A. Antoniadis*<sup>1</sup>; <sup>1</sup>Massachusetts Institute of Technology, Microsys. Tech. Lab., 60 Vassar St., MIT 39-617, Cambridge, MA 02139 USA; <sup>2</sup>Massachusetts Institute of Technology, Dept. of Matls. Sci. & Eng., 60 Vassar St., Cambridge, MA 02139 USA

### 2:40 PM II.B-4

**Nano-Scale Implantless Schottky-Barrier SOI FinFETs with Excellent Ambipolar Performance:** *H.-C. Lin*<sup>1</sup>; *M.-F. Wang*<sup>2</sup>; *F.-J. Hou*<sup>1</sup>; *J.-T. Liu*<sup>1</sup>; *F.-H. Ko*<sup>1</sup>; *H.-L. Chen*<sup>1</sup>; *G.-W. Huang*<sup>1</sup>; *T.-Y. Huang*<sup>1</sup>; *S. M. Sze*<sup>1</sup>; <sup>1</sup>National Nano Device Laboratories, 1001-1 Ta-Hsueh Rd, Hsin-Chu, Taiwan; <sup>2</sup>National Chiao-Tung University, Inst. of Elect., Hsin-Chu, Taiwan

### 3:00 PM Break

### 3:20 PM II.B-5

**Demonstration of FinFET CMOS Circuits:** *B. A. Rainey*<sup>1</sup>; *D. M. Fried*<sup>1</sup>; *M. Jeong*<sup>2</sup>; *J. Kedzierski*<sup>3</sup>; *E. J. Nowak*<sup>1</sup>; <sup>1</sup>IBM Microelectronics Division, Essex Junction, VT, USA; <sup>2</sup>IBM Semiconductor Research and Development Center, E. Fishkill, NY, USA; <sup>3</sup>IBM Research Division, Yorktown Heights, NY, USA

### 3:40 PM II.B-6

**High Performance Sub-100nm Si Thin-Film Transistors by Pattern-Controlled Crystallization of Thin Channel Layer and High Temperature Annealing:** *J. Gu*<sup>1</sup>; *W. Wu*<sup>1</sup>; *S. Y. Chou*<sup>1</sup>; <sup>1</sup>Princeton University, NanoStructure Lab., Dept. of Electl. Eng., Princeton, NJ 08544 USA

### 4:00 PM II.B-7

**Proposal of N-Channel Heterostructure Dynamic Threshold-Voltage MOSFET (HDTMOS) with P-Type Doped SiGe Body:** *T. Kawashima*<sup>1</sup>; *T. Takagi*<sup>1</sup>; *Y. Hara*<sup>1</sup>; *Y. Kanzawa*<sup>1</sup>; *A. Inoue*<sup>1</sup>; *H. Sorada*<sup>1</sup>; *K. Nozawa*<sup>1</sup>; *A. Asai*<sup>1</sup>; *T. Ohnishi*<sup>1</sup>; *M. Kubo*<sup>1</sup>; <sup>1</sup>Matsushita Electric Industrial Company, Ltd., Adv. Tech. Rsrch. Lab., 3-1-1, Yagumo-Nakamachi, Moriguchi, Osaka 570-8501 Japan

### 4:20 PM II.B-8

**90 GHz  $F_{\text{t}}$  SiGe HFET with Fully Optical Self-Aligned Sub-100nm Gate:** *M. Zeuner*<sup>1</sup>; *A. Fox*<sup>2</sup>; *T. Hackbarth*<sup>1</sup>; *D. Behammer*<sup>3</sup>; *U. Konig*<sup>1</sup>; <sup>1</sup>Daimler Chrysler Research Center Ulm, Wilhelm-Runge-Str. 11, Ulm D-89081 Germany; <sup>2</sup>IHP, Im Technologiepark 25, D-15236 Frankfurt(Oder); <sup>3</sup>United Monolithic Semiconductors GmbH, Wilhelm-Runge-Str. 11, Ulm D-89081 Germany

## III.-1

**Reliability and ESD for High Voltage LDMOS with SenseFET:** Y. S. Choi<sup>1</sup>; J. J. Kim<sup>1</sup>; C. K. Jeon<sup>1</sup>; M. H. Kim<sup>1</sup>; S. L. Kim<sup>1</sup>; H. S. Kang<sup>1</sup>; C. S. Song<sup>1</sup>; <sup>1</sup>Fairchild Semiconductor, 82-3, Dodang-Dong, Wonmi-Ku, Puchon, Kyonggi-Do 420-711 Korea

## III.-2

**A Novel Variational Approach for Modeling Sub-0.1 Micron MOS Devices Including Quantum Mechanical Interface Charge Confinement Effects:** N. G. Gunther<sup>1</sup>; A. A. Mutlu<sup>1</sup>; M. Rahman<sup>1</sup>; <sup>1</sup>Santa Clara University, Dept. of Electl. Eng., Santa Clara, CA 95053-0569 USA

## III.-3

**Nickel Induced Crystallization of a-Si Gate Electrode at 500°C and Gate Oxide Reliability:** A. R. Joshi<sup>1</sup>; K. C. Saraswat<sup>1</sup>; <sup>1</sup>Stanford University, CIS 006, 420 Via Ortega, Stanford, CA 94305-4070 USA

## III.-4

**Stable Breakdown Characteristics of 600V LDMOS by Extended P-Bottom Region:** S. L. Kim<sup>1</sup>; C. K. Jeon<sup>1</sup>; J. J. Kim<sup>1</sup>; Y. S. Choi<sup>1</sup>; M. H. Kim<sup>1</sup>; H. S. Kang<sup>1</sup>; C. S. Song<sup>1</sup>; <sup>1</sup>Fairchild Semiconductor, New Tech. Dvpt. Team, Puchon, Kyonggi-Do 420-711 Korea

## III.-5

**Symmetry Realization of BSIM Model with Dynamic Reference Method for Circuit Simulation:** X. Xi<sup>1</sup>; K. Cao<sup>1</sup>; J. He<sup>1</sup>; H. Wan<sup>1</sup>; M. Chan<sup>1</sup>; C. Hu<sup>1</sup>; <sup>1</sup>University of California, Dept. of Electl. Eng. & Compu. Sci., Berkeley, CA 94720 USA

## III.-6

**Newly Designed Isolated RESURF LDMOS Transistor for 60V BCD Process Provides 20V Vertical NPN Transistor:** T. H. Kwon<sup>1</sup>; Y. S. Jeoung<sup>1</sup>; S. K. Lee<sup>1</sup>; Y. C. Choi<sup>1</sup>; C. J. Kim<sup>1</sup>; H. S. Kang<sup>1</sup>; C. S. Song<sup>1</sup>; <sup>1</sup>Fairchild Korea Semiconductor Process Development Group, 82-3, Dodang-Dong, Wonmi-Ku, Puchon, Kyonggi-Do, Korea

## III.-7

**High Performance 40-GHz Bandpass Filters on Si Using Proton Implantation:** K. T. Chan<sup>1</sup>; C. Y. Chen<sup>1</sup>; A. Chin<sup>1</sup>; J. C. Hsieh<sup>2</sup>; J. Liu<sup>2</sup>; T. S. Duh<sup>3</sup>; W. J. Lin<sup>3</sup>; <sup>1</sup>National Chiao Tung University, Dept. of Elect. Eng., Hsinchu, Taiwan; <sup>2</sup>United Microelectronics Cooperation, Hsinchu, Taiwan; <sup>3</sup>Institute of Nuclear Energy Research, Taoyuan, Taiwan

## III.-8

**RF Noise in Deep Sub- $\mu$ m MOSFETs and Proposed Solution:** C. H. Huang<sup>1</sup>; C. H. Lai<sup>1</sup>; J. C. Hsieh<sup>2</sup>; J. Liu<sup>2</sup>; A. Chin<sup>1</sup>; <sup>1</sup>National Chiao Tung University, Dept. of Elect. Eng., Hsinchu, Taiwan; <sup>2</sup>United Microelectronics Cooperation, Hsinchu, Taiwan

## III.-9

**An Enhanced Compact Waffle MOSFET for RF Integrated Circuits:** S. Lam<sup>1</sup>; W. H. Ki<sup>1</sup>; P. K. Ko<sup>1</sup>; M. Chan<sup>1</sup>; <sup>1</sup>Hong Kong University of Science & Technology, Dept. of Electl. & Elect. Eng., Hong Kong

## III.-10

**Improved MOSFET Electron Mobility for Advanced Gate Dielectric Stacks:** I. Polishchuk<sup>1</sup>; K. J. Yang<sup>1</sup>; T.-J. King<sup>1</sup>; C. Hu<sup>1</sup>; <sup>1</sup>University of California, Dept. of Electl. Eng. & Compu. Scis., Berkeley, CA 94720 USA

## III.-11

**Speed Advantage of Optimized Metal S/D in 25 nm Dual-Gate Fully-Depleted CMOS:** D. Connelly<sup>1</sup>; D. Grupp<sup>1</sup>; D. Yergeau<sup>2</sup>; <sup>1</sup>Acorn Technologies; <sup>2</sup>Stanford University, CA, USA

## III.-12

**Normal Incidence Long-Wave Infrared InAs/In<sub>0.15</sub>Ga<sub>0.85</sub>As DWELL Detectors Operating at 8.2 $\mu$ m:** S. Krishna<sup>1</sup>; S. Raghavan<sup>1</sup>; B. Fuchs<sup>1</sup>; A. Stintz<sup>1</sup>; K. Malloy<sup>1</sup>; C. Morath<sup>2</sup>; D. Le<sup>2</sup>; D. A. Cardimona<sup>2</sup>; <sup>1</sup>University of New Mexico, Ctr. for High Tech. Matls., EECE Dept., Albuquerque, NM 87106 USA; <sup>2</sup>Air Force Research Lab (AFRL/VSSS) 3550 Aberdeen Ave. S.E., Bldg. 426, Kirtland AFB, NM 87117 USA

## III.-13

**High Luminous Flux Mirror-Substrate AlGaInP Large-Area Emitters:** R. H. Horng<sup>1</sup>; D. S. Wu<sup>2</sup>; S. H. Huang<sup>1</sup>; C. R. Chung<sup>3</sup>; <sup>1</sup>National Chung Hsing University, Inst. of Precision Eng., Taichung 402 Taiwan; <sup>2</sup>National Chung Hsing University, Dept. of Matls. Eng., Taichung 402 Taiwan; <sup>3</sup>Da-Yeh University, Inst. of Electl. Eng., Chang-Hwa 515, Taiwan

## III.-14

**SiGe-Channel 0.1- $\mu$ m pMOSFETs with Super Self-Aligned Ultra-Shallow Junction Formed by Selective In-Situ B-Doped SiGe CVD:** D. Lee<sup>1</sup>; M. Sakuraba<sup>1</sup>; T. Matsuura<sup>1</sup>; J. Murota<sup>1</sup>; T. Tsuchiya<sup>2</sup>; <sup>1</sup>Tohoku University, Lab. for Elect. Intelligent Sys., Res. Inst. of Elect. Comm., 2-

1-1 Katahira, Aoba-ku Sendai 980-8577 Japan; <sup>2</sup>Shimane University, Interdisciplinary Fac. of Sci. & Eng., Matsue, Shimane 690-8504 Japan

## III.-15

**Multiple Delta-Doped Layer Structures for Silicon Power MOSFETs:** C. Tolksdorf<sup>1</sup>; J. Schulze<sup>1</sup>; T. Sulima<sup>1</sup>; I. Eisele<sup>1</sup>; G. Deboy<sup>2</sup>; <sup>1</sup>Universität der Bundeswehr Munich, Inst. of Physics, Fac. EE & IT, Werner-Heisenberg-Weg 39, Neubiberg 85577 Germany; <sup>2</sup>Infineon Technologies AG Munich, Balanstrasse 73, Munchen 81541 Germany

## III.-16

**GaAs Schottky Varactor Diode Optimization for High-Performance Nonlinear Transmission Lines:** D. Sawdai<sup>1</sup>; D. Ko<sup>1</sup>; M. Kintis<sup>1</sup>; S. Maas<sup>2</sup>; X. Zhang<sup>1</sup>; S. Valdes<sup>1</sup>; E. Garber<sup>1</sup>; G. Barber<sup>1</sup>; E. Quach<sup>1</sup>; J. Newman<sup>1</sup>; F. Fong<sup>1</sup>; <sup>1</sup>TRW, Inc., Space & Elect. Grp., One Space Park, D1/1302, Redondo Beach, CA 90278 USA; <sup>2</sup>Nonlinear Technologies, Inc.

## III.-17

**A Novel Horizontal Current Bipolar Transistor (HCBT) for Vertical BiCMOS Integration:** T. Suligoj<sup>1</sup>; P. Biljanovic<sup>2</sup>; K. L. Wang<sup>1</sup>; <sup>1</sup>University of California at Los Angeles, Device Rsrch. Lab., Dept. of Electl. Eng., Los Angeles, CA 90095 USA; <sup>2</sup>University of Zagreb, Fac. of Electl. Eng. & Computing, Unska3, Zagreb HR-10000 Croatia

## III.-18

**The Effect of Scattering on Drive Current of Nanotransistors:** A. Svizhenko<sup>1</sup>; M. P. Anantram<sup>1</sup>; <sup>1</sup>NASA Ames Research Center, MS T27A-1, Moffett Field, CA 94035-1000 USA

## III.-19

**Optoelectronic Conversion through 850nm Band Single Mode Si<sub>3</sub>N<sub>4</sub> Photonic Waveguides for Si-On-Chip Integration:** T. Matsuura<sup>1</sup>; A. Yamada<sup>1</sup>; J. Murota<sup>1</sup>; E. Tamechika<sup>2</sup>; K. Wada<sup>3</sup>; L. C. Kimerling<sup>3</sup>; <sup>1</sup>RIEC Tohoku University, Katahira, Aoba-ku, Sendai 980-8577 Japan; <sup>2</sup>NTT Photonics Laboratories, Atsugi 243-0198; <sup>3</sup>MIT, Microph. Ctr., MA 02139 USA

## III.-20

**InP Hot Electron Transistor with a Buried Metallic Gate for Electron Emission:** Y. Miyamoto<sup>1</sup>; R. Yamamoto<sup>1</sup>; H. Maeda<sup>1</sup>; K. Takeuchi<sup>1</sup>; L.-E. Wernersson<sup>2</sup>; K. Furuya<sup>1</sup>; <sup>1</sup>Tokyo Institute of Technology, Dept. of Electl. & Elect. Eng., 2-12-1 O-okayama, Meguru-ku, Tokyo 152-8552 Japan; <sup>2</sup>Lund University, Solid State Physics/Nanometer Structure Consortium, Box 118, Lund S-22100 Sweden

## III.-21

**Memory Device Based on a Ferroelectric Tunnel Junction:** J. Rodriguez Contreras<sup>1,3</sup>; J. Schubert<sup>2</sup>; H. Kohlstedt<sup>1</sup>; R. Waser<sup>1</sup>; <sup>1</sup>Institut für Festkörperforschung, Julich 52425 Germany; <sup>2</sup>Institut für Schichten und Grenzflächen, Julich 52425 Germany

## III.-22

**Thermal Management and Device Failure Assessment of High-Power AlGaN/GaN HFETs:** M. Kuball<sup>1</sup>; S. Rajasingam<sup>1</sup>; A. Sarua<sup>1</sup>; J. M. Hayes<sup>1</sup>; M. J. Uren<sup>2</sup>; T. Martin<sup>2</sup>; R. S. Balmer<sup>2</sup>; B. T. Hughes<sup>2</sup>; K. P. Hilton<sup>2</sup>; <sup>1</sup>University of Bristol, H. H. Wills Physics Lab., Bristol BS8 1TL UK; <sup>2</sup>QinetiQ Ltd., St. Andrew's Rd., Malvern, Worcs WR14 3PS UK

## III.-23

**Room Temperature Grown Zirconia/SiO<sub>2</sub> Dielectric Stacks with 1 nm EOT:** S. Ramanathan<sup>1</sup>; P. C. McIntyre<sup>1</sup>; <sup>1</sup>Stanford University, Dept. of Matls. Sci. & Eng., Stanford, CA 94305 USA

## III.-24

**Graph-Based Quantum Integrated Circuits Using III-V Multi-Branch Nanowire Networks and their Nano-Schottky Gate Control:** S. Kasai<sup>1</sup>; M. Yumoto<sup>1</sup>; T. Fukushi<sup>1</sup>; T. Muranaka<sup>1</sup>; H. Hasegawa<sup>1</sup>; <sup>1</sup>Hokkaido University, Rsrch. Ctr. for Integrated Quantum Elect. & Grad. Sch. of Elect. & Info. Eng., N-13, W-8, Kita-ku, Sapporo 060-8628 Japan

## III.-25

**Tunneling through Multi-Layer Gate Dielectrics-An Analytical Model:** I. Polishchuk<sup>1</sup>; Y.-C. Yeo<sup>1</sup>; T.-J. King<sup>1</sup>; C. Hu<sup>1</sup>; <sup>1</sup>University of California, Dept. of EECS, Berkeley, CA 94720 USA

## III.-26

**Ultra High Fmax InP/InGaAs/InP Transferred Substrate DHBTS:** S. Lee<sup>1</sup>; M. Urteaga<sup>1</sup>; Y. Wei<sup>1</sup>; Y. Kim<sup>1</sup>; M. Dahlström<sup>1</sup>; S. Krishnan<sup>1</sup>; M. Rodwell<sup>1</sup>; <sup>1</sup>University of California, Dept. of ECE, Santa Barbara, CA 93106 USA

## III.-27

**Simulation of Quantum and Scattering Effects Along the Channel of Ultra-Scaled Si-Based MOSFETs:** W. Chen<sup>1</sup>; L. F. Register<sup>1</sup>; S. K. Banerjee<sup>1</sup>; <sup>1</sup>University of Texas at Austin, Microelect. Rsrch. Ctr., R9950, Austin, TX 78758 USA

## Emerging Technologies

TUESDAY AM, JUNE 25<sup>TH</sup>, 2002

*Session Organizer:* Jeffrey Welser, IBM Microelectronics

*Session Chair:* Hagen Klauk, Infineon Technologies

**8:30 AM IV-1 Invited**

**Hybrid-Gate Suspended Field-Effect Transistors for Gas Sensing:**

*I. Eisele*<sup>1</sup>; *M. Zimmer*<sup>1</sup>; <sup>1</sup>Universität der Bundeswehr München, Inst. of Physics, Fac. of Electl. Eng. & Info. Tech., Neubiberg 85577 Germany

**9:00 AM IV-2 Invited**

**Manipulation of Ferromagnetism in Magnetic Semiconductor Field**

**Effect Transistors:** *H. Ohno*<sup>1</sup>; <sup>1</sup>Tohoku University, Rsrch. Inst. of Electl. Comm., Katahira 2-1-1, Aoba-ku, Sendai 980-8577 Japan

**9:30 AM IV-3 Invited**

**Molecular-Scale Transistors Based on Self-Assembled Monolayers:**

*J. H. Schön*<sup>1</sup>; <sup>1</sup>Bell Laboratories, Lucent Technologies, 600 Mountain Ave., Murray Hill, NJ 07974 USA

**10:00 AM Break**

**10:20 AM IV-4 Invited**

**Designing In-Vitro Patterned Neuronal Network:** *B. C. Wheeler*<sup>1</sup>;

<sup>1</sup>University of Illinois at Urbana-Champaign, Electl. & Compu. Eng. Dept. & Beckman Inst., 405 N. Mathews Ave., Urbana, IL 61801 USA

**10:50 AM IV-5 Invited**

**Structured Cold Point Thermoelectric Coolers:** *U. Goshal*<sup>1</sup>;

<sup>1</sup>Austin Research Laboratory, IBM Rsrch., 11400 Burnet Rd., Austin, TX 78758 USA

**11:20 AM IV-6 Invited**

**The Second Revolution—Mixed-Technology Integrated**

**Microsystems:** *T. E. Zipperian*<sup>1</sup>; <sup>1</sup>Sandia National Laboratories, Microsys. Sci., Tech. & Components, PO Box 5800, Albuquerque, NM 87185-1077 USA

## Optical Devices

TUESDAY PM, JUNE 25<sup>TH</sup>, 2002

*Session Organizers:* Kent Choquette, University of Illinois at Urbana-Champaign

*Session Chair:* Tom Zipperian, Sandia National Laboratories

### 2:00 PM V.A-1 Invited

**Quantum Dot Lasers: Temperature Insensitive Operation and the Prospect for High Speed Modulation:** *D. G. Deppe*<sup>1</sup>; O. B. Shchekin<sup>1</sup>; <sup>1</sup>University of Texas at Austin, Microelect. Rsrch. Ctr., Austin, TX 78712 USA

### 2:30 PM V.A-2

**Quantum Dot Tunnel Injection Lasers with Large Modulation Bandwidth at Room Temperature:** *S. Ghosh*<sup>1</sup>, P. Bhattacharya<sup>1</sup>; Z-K. Wu<sup>1</sup>; T. Norris<sup>1</sup>; J. Singh<sup>1</sup>; B. Kochman<sup>1</sup>; <sup>1</sup>University of Michigan, Dept. of Elect. Eng. & Compu. Sci., Ann Arbor, MI 48109-2122 USA

### 2:50 PM V.A-3

**A 1.5  $\mu\text{m}$  GaInNAs(Sb) Laser Grown on GaAs by MBE:** *W. Ha*<sup>1</sup>; V. Gambin<sup>1</sup>; S. Bank<sup>1</sup>; M. Wistey<sup>1</sup>; H. Yuen<sup>1</sup>; S. Kim<sup>1</sup>; J. S. Harris, Jr.<sup>1</sup>; <sup>1</sup>Stanford University, Solid State & Photonics Lab., CISX B113-3, Via Ortega, Stanford, CA 94305 USA

### 3:10 PM Break

### 3:30 PM V.A-4

**Technology and Performance of Submicron Metal-Semiconductor-Metal GaN Ultraviolet Detectors:** *T. Palacios*<sup>1</sup>; E. Monroy<sup>1,2</sup>; F. Calle<sup>1</sup>; F. Omnes<sup>3</sup>; <sup>1</sup>Universidad Politecnica de Madrid, ISOM & Dpto. Ingenieria Electronica, ETSI de Telecomunicacion, Ciudad Universitaria, s/n Madrid 28040 Spain; <sup>2</sup>CEA, Dept. De Recherche Fondamentale sur la Matiere Condensee, Grenoble Cedex 9, 38054 France; <sup>3</sup>Centre de Recherche sur l'Hetero-Epitaxie et ses Applications, CNRS, Valbonne 06560 France

### 3:50 PM V.A-5

**GaAlAs/GaAs Micromachined Tunable Vertical Filter with Low Tuning Voltage Below 5 Volts:** *T. Amano*<sup>1</sup>; F. Koyama<sup>1</sup>; T. Hino<sup>1</sup>; M. Arai<sup>1</sup>; A. Matsutani<sup>1</sup>; <sup>1</sup>Tokyo Institute of Technology, Microsys. Rsrch. Ctr., Precision & Intelligence Lab., 4259 Nagatsuta, Midori-ku, Yokohama 226-8503 Japan

### 4:10 PM V.A-6 Invited

**Polymer LEDs and LASERS for Integrated Optics:** *M. D. McGehee*<sup>1</sup>; <sup>1</sup>Stanford University, Dept. of Matls. Sci. & Eng., Bldg. 550, Stanford, CA 94305 USA

## Nanoscale & Tunneling Devices

TUESDAY PM, JUNE 25<sup>TH</sup>, 2002

*Session Organizer:* Vivek Subramanian, University of California at Berkeley

*Session Chair:* Nick Lindert, Intel

### 2:10 PM V.B-1

**Contact Printing with Nanometer Resolution:** *Y. L. Loo*<sup>1</sup>; R. L. Willett<sup>1</sup>; K. W. Baldwin<sup>1</sup>; J. A. Rogers<sup>1</sup>; <sup>1</sup>Bell Laboratories, Lucent Technologies, 600 Mountain Ave., Murray Hill, NJ 07974 USA

### 2:30 PM V.B-2

**Charge Retention Characteristics of SiGe Quantum Dot Flash Memories:** *D.-W. Kim*<sup>1</sup>; F. E. Prins<sup>1</sup>; T. Kim<sup>1</sup>; D.-L. Kwong<sup>1</sup>; S. Banerjee<sup>1</sup>; <sup>1</sup>University of Texas at Austin, Microelect. Rsrch. Ctr., Austin, TX 78712 USA

### 2:50 PM V.B-3

**Multilayer Tunneling Barriers for Nonvolatile Memory Applications:** *P. Blomme*<sup>1,2</sup>; B. Govoreanu<sup>1,2</sup>; M. Rosmeulen<sup>1,2</sup>; J. Van Houdt<sup>1</sup>; K. DeMeyer<sup>1,2</sup>; <sup>1</sup>IMEC, STDI Div., Kapeldreef 75, Leuven 3001 Belgium; <sup>2</sup>ESAT, KU Leuven, Kasteelpark Arenberg 10, Leuven 3001 Belgium

### Break 3:10 PM

### 3:30 PM V.B-4

**A Resonant Tunneling Permeable Base Transistor with Al-Free Tunneling Barriers:** E. Lindstrom<sup>1</sup>; I. Pietzonka<sup>1</sup>; W. Seifert<sup>1</sup>; L. E. Wernersson<sup>1</sup>; <sup>1</sup>Lund University, Solid State Physics/Nanometer Consortium, Box 118, S-22100 Sweden

### 3:50 PM V.B-5

**Room Temperature Negative Differential Resistance in AlN/GaN Double Barrier Resonant Tunneling Diodes Grown by RF-Plasma Assisted Molecular Beam Epitaxy:** *A. Kikuchi*<sup>1</sup>; R. Bannai<sup>1</sup>; K. Kishino<sup>1</sup>; <sup>1</sup>Sophia University, Electl. & Elect. Eng., 7-1, Kioi-cho, Chiyoda-ku, Tokyo 102-8554 Japan

### 4:10 PM V.B-6

**A Novel Frequency-Doubling Device Based on Three-Terminal Ballistic Junction:** *I. Shorubalko*<sup>1</sup>; H. Q. Xu<sup>1</sup>; I. Maximov<sup>1</sup>; D. Nilsson<sup>1</sup>; P. Omling<sup>1</sup>; L. Samuelson<sup>1</sup>; W. Seifert<sup>1</sup>; <sup>1</sup>Lund University, Solid State Physics & the Nanometer Consortium, Box 118, Lund SE-22100 Sweden

## III-V Devices

WEDNESDAY AM, JUNE 26<sup>TH</sup>, 2002

*Session Organizers:* Yasuyuki Miyamoto, Tokyo Institute of Technology

*Session Chair:* Aaron Oki, TRW

**10:00 AM VI.A-1 Invited**

**InP-Based HEMTs with a Cutoff Frequency Higher than 450 Ghz:** K. Shinohara<sup>1</sup>; Y. Yamashita<sup>2</sup>; A. Endoh<sup>2</sup>; K. Hikosaka<sup>2</sup>; T. Matsui<sup>1</sup>; T. Mimura<sup>2</sup>; S. Hiyamizu<sup>3</sup>; <sup>1</sup>Communications Research Laboratory, 4-2-1 Nukui-kitamachi, Koganei, Tokyo 184-8795 Japan; <sup>2</sup>Fujitsu Laboratories, Ltd, Kanagawa, Japan; <sup>3</sup>Osaka University, Osaka, Japan

**10:30 AM VI.A-2**

**Suppression of Drain Conductance Frequency Dispersion in InP-Based HEMTs by Eliminating Hole Accumulation:** T. Arai<sup>1</sup>; K. Sawada<sup>1</sup>; N. Okamoto<sup>1</sup>; K. Makiyama<sup>1</sup>; T. Takahashi<sup>1</sup>; N. Hara<sup>1</sup>; <sup>1</sup>Fujitsu Laboratories, Ltd., 10-1 Morinosato-Wakamiya, Atsugi, Kanagawa 243-0197 Japan

**10:50 AM VI.A-3**

**Thermal Performance of Metamorphic Double Heterojunction Bipolar Transistors with InP and InAlP Buffer Layers:** Y. M. Kim<sup>1</sup>; M. Dahlström<sup>1</sup>; M. J.W. Rodwell<sup>1</sup>; A. C. Gossard<sup>1</sup>; <sup>1</sup>University of California, Dept. of ECE, Santa Barbara, CA 93106 USA

**11:10 AM VI.A-4**

**InAlAs/InGaAs/InP DHBTs with Polycrystalline InAs Extrinsic Emitter Regrowth:** D. Scott<sup>1</sup>; H. Xing<sup>1</sup>; S. Krishnan<sup>1</sup>; M. Urteaga<sup>1</sup>; N. Parthasarathy<sup>1</sup>; M. Rodwell<sup>1</sup>; <sup>1</sup>University of California, Dept. of ECE, Santa Barbara, CA 93106 USA

## Column IV Power Devices

WEDNESDAY PM, JUNE 26TH, 2002

*Session Organizer:* Jeff Casady, Mississippi State University

*Session Chair:* Jesse Tucker, General Electric Corporate R&D

### 2:00 PM VII.A-1 Invited

**High Power Hybrid and MMIC Amplifiers using Wide-Bandgap Semiconductor Devices on Semi-Insulating SiC Substrates:** *S. T. Sheppard*<sup>1</sup>; R. P. Smith<sup>1</sup>; W. L. Pribble<sup>1</sup>; Z. Ring<sup>1</sup>; T. Smith<sup>1</sup>; S. T. Allen<sup>1</sup>; J. Milligan<sup>1</sup>; J. W. Palmour<sup>1</sup>; <sup>1</sup>Cree, Inc., 4600 Silicon Dr., Durham, NC 27703 USA

### 2:30 PM VII.A-2

**A Silicon Carbide Self-Aligned and Ion Implanted Static Induction Transistor (SAI-SIT) for 150 Watt S-Band Operation:** *T. J. Knight*<sup>1</sup>; R. C. Clarke<sup>1</sup>; R. R. Barron<sup>1</sup>; J. A. Ostop<sup>1</sup>; B. A. Morick<sup>1</sup>; J. R. Gigante<sup>1</sup>; W. J. Malkowski<sup>1</sup>; A. W. Morse<sup>1</sup>; G. C. DeSalvo<sup>1</sup>; K. J. Petrosky<sup>1</sup>; W. R. Curtice<sup>2</sup>; <sup>1</sup>Northrup Grumman Corporation, Baltimore, MD 21090 USA; <sup>2</sup>W. R. Curtice Consulting, Washington Crossing, PA 18977 USA

### 2:50 PM VII.A-3

**First Diamond FET RF Power Measurement on Diamond Quasi-Substrate:** A. Aleksov<sup>1</sup>; M. Kubovic<sup>1</sup>; N. Kaeb<sup>1</sup>; U. Spitzberg<sup>1</sup>; I. Daumiller<sup>1</sup>; Th. Bauer<sup>2</sup>; M. Schreck<sup>2</sup>; B. Stritzker<sup>2</sup>; E. Kohn<sup>1</sup>; <sup>1</sup>University of Ulm, Dept. of Electron Devices & Circuits, Albert-Einstaein-Allee 45, Ulm D-89081 Germany; <sup>2</sup>Universitaet Augsburg, Inst. fuer Physik, Augsburg D-86135 Germany

### 3:10 PM Break

### 3:30 PM VII.A-4

**4H-SiC Power Bioplar Transistors with Common Emitter Current Gain > 50:** *C.-F. Huang*<sup>1</sup>; J. A. Cooper, Jr.<sup>1</sup>; <sup>1</sup>Purdue University, Sch. of ECE, W. Lafayette, IN 47907-1285 USA

### 3:50 PM VII.A-5

**Self-Aligned Extended-Drain with Compensating Ion-Implantation for Extended-SOA in 30V Lateral MOS:** *S. K. Lee*<sup>1</sup>; C. J. Kim<sup>1</sup>; Y. C. Choi<sup>1</sup>; T. H. Kwon<sup>1</sup>; Y. S. Jung<sup>1</sup>; H. S. Kang<sup>1</sup>; C. S. Song<sup>1</sup>; <sup>1</sup>Fairchild Korea Semiconductor Process Development Group, 82-3, Dodang-Dong, Wonmi-Ku, Puchon, Kyunggi-Do, Korea

## MOS Dielectrics

WEDNESDAY PM, JUNE 26TH, 2002

*Session Organizer:* Leonard Franklin Register, University of Texas at Austin

*Session Chair:* Jack Lee, University of Texas at Austin

### 2:10 PM VII.B-1

**Direct Evidence for Multiple Vibrational Excitation of Si-H/D Bonds for Hot-Carrier Degradation of MOS Transistors:** Z. Chen<sup>1</sup>; P. Ong<sup>1</sup>; <sup>1</sup>University of Kentucky, Dept. of Electl. & Computer Eng. & Ctr. for Micro-Magnetic & Elect. Devices, Lexington, KY 40506 USA

### 2:30 PM VII.B-2

**Ultrathin High-K Gate Dielectric Technology for Germanium MOS Applications:** C. O. Chui<sup>1</sup>; S. Ramanathan<sup>2</sup>; B. B. Triplett<sup>2</sup>; P. C. McIntyre<sup>2</sup>; K. C. Saraswat<sup>1</sup>; <sup>1</sup>Stanford University, Dept. of Electl. Eng., Stanford, CA 94305 USA; <sup>2</sup>Stanford University, Dept. of Matls. Sci. & Eng., Stanford, CA 94305 USA

### 2:50 PM VII.B-3

**High Quality MOSFETs Fabrication with HfO<sub>2</sub> Gate Dielectric and TaN Gate Electrode:** R. Choi<sup>1</sup>; K. Onishi<sup>1</sup>; C. S. Kang<sup>1</sup>; R. Nieh<sup>1</sup>; S. Gopalan<sup>1</sup>; H.-J. Cho<sup>1</sup>; S. Krishnan<sup>1</sup>; J. C. Lee<sup>1</sup>; <sup>1</sup>The University of Texas at Austin, Microelect. Rsrch. Ctr., R9950, Dept. of Electl. & Computer Eng., Austin, TX 78758 USA

### 3:10 PM Break

### 3:30 PM VII.B-4

**Impact of NH<sub>3</sub> Pre-Treatment on the Electrical and Reliability Characteristics of Ultra Thin Hafnium Silicate Films Prepared by Re-Oxidation Method:** S. Gopalan<sup>1</sup>; R. Choi<sup>1</sup>; K. Onishi<sup>1</sup>; R. Nieh<sup>1</sup>; C. S. Kang<sup>1</sup>; H.-J. Cho<sup>1</sup>; S. Krishnan<sup>1</sup>; J. C. Lee<sup>1</sup>; <sup>1</sup>University of Texas at Austin, Microelect. Rsrch. Ctr., MC R9950, Austin, TX 78758 USA

### 3:50 PM VII.B-5

**A Comparative Study of RF Noise Characteristics of Different Submicron SOI MOSFET Structures on SIMOX Technology:** S. Lam<sup>1</sup>; H. Wang<sup>1</sup>; W.-K. Lee<sup>1</sup>; P. K. Ko<sup>1</sup>; M. Chan<sup>1</sup>; <sup>1</sup>Hong Kong University of Science & Technology, Dept. of Electl. & Elect. Eng., Hong Kong



# Index

## A

Adivarahan, V ..... 21, 29  
Aleksov, A ..... 173, 181  
Allen, S T ..... 173, 175  
Amano, T ..... 133, 143  
Anantram, M P ..... 55, 91  
Antcliffe, M ..... 21, 23  
Antoniadis, D A ..... 35, 43  
Arai, M ..... 133, 143  
Arai, T ..... 161, 167  
Asai, A ..... 35, 51

## B

Baldwin, K W ..... 147, 149  
Balmer, R S ..... 55, 99  
Banerjee, S ..... 1, 147, 151  
Banerjee, S K ..... 55, 109  
Bank, S ..... 133, 139  
Bannai, R ..... 147, 157  
Barber, G ..... 55, 87  
Barron, R R ..... 173, 179  
Barsky, M ..... 21, 27  
Bauer, Th ..... 173, 181  
Behammer, D ..... 35, 53  
Belford, R E ..... 35, 41  
Ben-Yaacov, I ..... 21, 31  
Bhattacharya, P ..... 133, 137  
Biljanovic, P ..... 55, 89  
Blomme, P ..... 147, 153  
Brar, B ..... 21  
Buttari, D ..... 21, 25

## C

Calle, F ..... 133, 141  
Cao, K ..... 55, 65  
Cardimona, D A ..... 55, 79  
Casady, J ..... 173  
Chan, K T ..... 55, 69  
Chan, M ..... 55, 65  
Chan, M ..... 55, 73, 187, 197  
Chen, C Y ..... 55, 69  
Chen, H-L ..... 35, 45  
Chen, W ..... 55, 109  
Chen, Z ..... 187, 189  
Chin, A ..... 55, 69, 71  
Chini, A ..... 21, 25  
Cho, H-J ..... 187, 193, 195  
Choi, R ..... 187, 193, 195  
Choi, Y C ..... 55, 67, 173, 185  
Choi, Y S ..... 55, 57, 63  
Choquette, K ..... 133  
Chou, S Y ..... 35, 49  
Chui, C O ..... 187, 191  
Chung, C R ..... 55, 81  
Clarke, R C ..... 173, 179  
Coffie, R ..... 21, 25  
Connelly, D ..... 55, 77

Cooper, Jr, J A ..... 173, 183  
Curtice, W R ..... 173, 179

## D

Dahlström, M ..... 55, 107, 161, 169  
Daumiller, I ..... 173, 181  
Deboy, G ..... 55, 85  
Deelman, P ..... 21, 23  
DeMeyer, K ..... 147, 153  
DenBaars, S P ..... 21, 31  
Deppe, D G ..... 133, 135  
DeSalvo, G C ..... 173, 179  
Duh, T S ..... 55, 69

## E

Eisele, I ..... 55, 85, 111, 113  
Endoh, A ..... 161, 163

## F

Fitzgerald, E A ..... 35, 43  
Fong, F ..... 55, 87  
Fox, A ..... 35, 53  
Fried, D ..... 35  
Fried, D M ..... 35, 47  
Fuchs, B ..... 55, 79  
Fukushi, T ..... 55, 103  
Furuya, K ..... 55, 95

## G

Gambin, V ..... 133, 139  
Garber, E ..... 55, 87  
Ghosh, S ..... 133, 137  
Gigante, J R ..... 173, 179  
Gopalan, S ..... 187, 193, 195  
Goshal, U ..... 111, 125  
Gossard, A C ..... 161, 169  
Govoreanu, B ..... 147, 153  
Grupp, D ..... 55, 77  
Gu, J ..... 35, 49  
Gunther, N G ..... 55, 59  
Gurtner, C ..... 1, 17

## H

Ha, W ..... 133, 139  
Hackbarth, T ..... 35, 53  
Hah, D ..... 1, 13  
Hara, N ..... 161, 167  
Hara, Y ..... 35, 51  
Harris, Jr, J S ..... 133, 139  
Hasegawa, H ..... 55, 103  
Hashimoto, P ..... 21, 23  
Hayes, J M ..... 55, 99  
He, J ..... 55, 65  
Heikman, S ..... 21, 25, 31  
Hikosaka, K ..... 161, 163  
Hilton, K P ..... 55, 99  
Hino, T ..... 133, 143  
Hiyamizu, S ..... 161, 163

Hornig, R H ..... 55, 81  
Hou, F-J ..... 35, 45  
Hoyt, J L ..... 35, 43  
Hsieh, J C ..... 55, 69, 71  
Hsu, J WP ..... 21, 33  
Hu, C ..... 55, 65, 75, 105  
Hu, M ..... 21, 23  
Huang, C-F ..... 173, 183  
Huang, C H ..... 55, 71  
Huang, G-W ..... 35, 45  
Huang, S ..... 1, 13  
Huang, S H ..... 55, 81  
Huang, T-Y ..... 35, 45  
Hughes, B T ..... 55, 99  
Hussian, T ..... 21, 23

## I

Ieong, M ..... 35, 47  
Inoue, A ..... 35, 51

## J

Jena, D ..... 21, 25  
Jeon, C K ..... 55, 57, 63  
Jeoung, Y S ..... 55, 67  
Jimenez, A ..... 21, 25  
Joshi, A R ..... 55, 61  
Jung, Y S ..... 173, 185

## K

Kaeb, N ..... 173, 181  
Kang, C S ..... 187, 193, 195  
Kang, H S ..... 55, 57, 63, 67, 173, 185  
Kanzawa, Y ..... 35, 51  
Kasai, S ..... 55, 103  
Kawashima, T ..... 35, 51  
Kedzierski, J ..... 35, 47  
Keller, S ..... 21, 25  
Khan, M A ..... 21, 27, 29  
Ki, W H ..... 55, 73  
Kikuchi, A ..... 147, 157  
Kim, C J ..... 55, 67, 173, 185  
Kim, D-W ..... 147, 151  
Kim, J J ..... 55, 57, 63  
Kim, M H ..... 55, 57, 63  
Kim, S ..... 133, 139  
Kim, S L ..... 55, 57, 63  
Kim, T ..... 147, 151  
Kim, Y ..... 55, 107  
Kim, Y M ..... 161, 169  
Kimerling, L C ..... 55, 93  
King, T-J ..... 55, 75, 105  
Kintis, M ..... 55, 87  
Kishino, K ..... 147, 157  
Klauck, H ..... 111  
Knight, T J ..... 173, 179  
Ko, D ..... 55, 87  
Ko, F-H ..... 35, 45  
Ko, P K ..... 55, 73, 187, 197  
Kochman, B ..... 133, 137  
Kohlstedt, H ..... 55, 97  
Kohn, E ..... 173, 181  
Konig, U ..... 35, 53

Koudymov, A ..... 21, 29  
 Koyama, F ..... 133, 143  
 Krishna, S ..... 55, 79  
 Krishnan, S ..... 55, 107, 161, 171  
 Krishnan, S ..... 187, 193, 195  
 Kroemer, H ..... 1, 3  
 Kuball, M ..... 55, 99  
 Kubo, M ..... 35, 51  
 Kubovic, M ..... 173, 181  
 Kwon, T H ..... 55, 67, 173, 185  
 Kwong, D-L ..... 147, 151

## L

Lai, C H ..... 55, 71  
 Lam, S ..... 55, 73, 187, 197  
 Lang, D V ..... 21, 33  
 Le, D ..... 55, 79  
 Lee, M C M ..... 1, 13  
 Lee, D ..... 55, 83  
 Lee, J ..... 187  
 Lee, J C ..... 187, 193, 195  
 Lee, S ..... 55, 107  
 Lee, S K ..... 55, 67, 173, 185  
 Lee, W-K ..... 187, 197  
 Leitz, C W ..... 35, 43  
 Lin, H-C ..... 35, 45  
 Lin, W J ..... 55, 69  
 Lindert, N ..... 147  
 Lindstrom, E ..... 147, 155  
 Liu, J-T ..... 35, 45  
 Liu, J ..... 55, 69, 71  
 Liu, Q ..... 35, 41  
 Loo, Y L ..... 147, 149

## M

Maas, S ..... 55, 87  
 Madou, M ..... 1, 17  
 Maeda, H ..... 55, 95  
 Makiyama, K ..... 161, 167  
 Malkowski, W J ..... 173, 179  
 Malloy, K ..... 55, 79  
 Manfra, M J ..... 21, 33  
 Martin, T ..... 55, 99  
 Matsui, T ..... 161, 163  
 Matsutani, A ..... 133, 143  
 Matsuura, T ..... 55, 83  
 Matsuura, T ..... 55, 93  
 Maximov, I ..... 147, 159  
 McCray, L ..... 21, 23  
 McGehee, M D ..... 133, 145  
 McIntyre, P C ..... 55, 101, 187, 191  
 Micovic, M ..... 21, 23  
 Milligan, J ..... 173, 175  
 Mimura, T ..... 161, 163  
 Mishra, U K ..... 21, 25, 31  
 Miyamoto, Y ..... 161  
 Miyamoto, Y ..... 55, 95  
 Molnar, R J ..... 21, 33  
 Monroy, E ..... 133, 141  
 Moon, J S ..... 21, 23  
 Morath, C ..... 55, 79  
 Morick, B A ..... 173, 179  
 Morse, A W ..... 173, 179  
 Muranaka, T ..... 55, 103

Murota, J ..... 55, 83  
 Murota, J ..... 55, 93  
 Mutlu, A A ..... 55, 59

## N

Nayfeh, H M ..... 35, 43  
 Newman, J ..... 55, 87  
 Ngo, C ..... 21, 23  
 Nguyen, C T-C ..... 1, 9  
 Nguyen, C ..... 21  
 Nieh, R ..... 187, 193, 195  
 Nilsson, D ..... 147, 159  
 Norris, T ..... 133, 137  
 Nowak, E ..... 35  
 Nowak, E J ..... 35, 47  
 Nozawa, K ..... 35, 51

## O

Ohnishi, T ..... 35, 51  
 Ohno, H ..... 111, 117  
 Okamoto, N ..... 161, 167  
 Oki, A ..... 161  
 Omling, P ..... 147, 159  
 Omnes, F ..... 133, 141  
 Ong, P ..... 187, 189  
 Onishi, K ..... 187, 193, 195  
 Ostop, J A ..... 173, 179

## P

Palacios, T ..... 133, 141  
 Palmour, J W ..... 173, 175  
 Parthasarathy, N ..... 161, 171  
 Patterson, P R ..... 1, 13  
 Petrosky, K J ..... 173, 179  
 Pfeiffer, L N ..... 21, 33  
 Pietzonka, I ..... 147, 155  
 Pitera, A J ..... 35, 43  
 Polishchuk, I ..... 55, 75, 105  
 Potashnik, J ..... 35, 41  
 Pribble, W L ..... 173, 175  
 Prins, F E ..... 147, 151

## Q

Quach, E ..... 55, 87

## R

Raghavan, S ..... 55, 79  
 Rahman, M ..... 55, 59  
 Rainey, B A ..... 35, 47  
 Rajasingam, S ..... 55, 99  
 Ramanathan, S ..... 55, 101, 187, 191  
 Register, L F ..... 55, 109, 187  
 Ring, Z ..... 173, 175  
 Rodriguez Contreras, J ..... 55, 97  
 Rodwell, M ..... 55, 107, 161, 169, 171  
 Rogers, J A ..... 147, 149  
 Rosmeulen, M ..... 147, 153

## S

Sakuraba, M ..... 55, 83  
 Samuelson, L ..... 147, 159  
 Sandhu, R ..... 21, 27  
 Saraswat, K C ..... 55, 61, 187, 191  
 Sarua, A ..... 55, 99  
 Sawada, K ..... 161, 167  
 Sawdai, D ..... 55, 87  
 Schön, J H ..... 111, 119  
 Schreck, M ..... 173, 181  
 Schubert, J ..... 55, 97  
 Schulze, J ..... 55, 85  
 Scott, D ..... 161, 171  
 Seabaugh, A ..... 35, 41  
 Seck, Y-K ..... 21, 31  
 Seifert, W ..... 147, 155, 159  
 Shatalov, M ..... 21, 29  
 Shchekin, O B ..... 133, 135  
 Shen, L ..... 21, 25  
 Sheppard, S T ..... 173, 175  
 Shinohara, K ..... 161, 163  
 Shorubalko, I ..... 147, 159  
 Simin, G ..... 21, 29  
 Singh, J ..... 133, 137  
 Smith, R P ..... 173, 175  
 Smith, T ..... 173, 175  
 Smorchkova, I ..... 21, 27  
 Song, C S ..... 55, 57, 63, 67, 173, 185  
 Sorada, H ..... 35, 51  
 Spitzberg, U ..... 173, 181  
 Stintz, A ..... 55, 79  
 Stritzker, B ..... 173, 181  
 Subramanian, V ..... 147  
 Suligoj, T ..... 55, 89  
 Sulima, T ..... 55, 85  
 Svizhenko, A ..... 55, 91  
 Sze, S M ..... 35, 45

## T

Takagi, S ..... 35, 37  
 Takagi, T ..... 35, 51  
 Takahashi, T ..... 161, 167  
 Takeuchi, K ..... 55, 95  
 Tamechika, E ..... 55, 93  
 Tolksdorf, C ..... 55, 85  
 Triplett, B B ..... 187, 191  
 Tsai, J-C ..... 1, 13  
 Tsai, R ..... 21, 27  
 Tsuchiya, T ..... 55, 83  
 Tucker, J ..... 173

## U

Uren, M J ..... 55, 99  
 Urteaga, M ..... 55, 107, 161, 171

## V

Valdes, S ..... 55, 87  
 Van Houdt, J ..... 147, 153

**W**

Wada, K ..... 55, 93  
Wan, W ..... 55, 65  
Wang, H ..... 21, 27  
Wang, H ..... 187, 197  
Wang, K L ..... 55, 89  
Wang, M-F ..... 35, 45  
Waser, R ..... 55, 97  
Wei, Y ..... 55, 107  
Weiman, N G ..... 21, 33  
Welser, J ..... 1, 111  
Wernersson, L-E ..... 55, 95  
Wernersson, L E ..... 147, 155  
West, K W ..... 21, 33  
Wheeler, B C ..... 111, 121  
Willett, R L ..... 147, 149  
Wistey, M ..... 133, 139  
Wojtokwicz, M ..... 21, 27  
Wong, D ..... 21, 23  
Wu, M C ..... 1, 13  
Wu, W ..... 35, 49  
Wu, Z-K ..... 133, 137  
Wuu, D S ..... 55, 81

**X**

Xi, X ..... 55, 65  
Xing, H ..... 161, 171  
Xu, H Q ..... 147, 159

**Y**

Yamada, A ..... 55, 93  
Yamamoto, R ..... 55, 95  
Yamashita, Y ..... 161, 163  
Yang, J W ..... 21, 27  
Yang, K J ..... 55, 75  
Yeo, Y-C ..... 55, 105  
Yergeau, D ..... 55, 77  
Yuen, H ..... 133, 139  
Yumoto, M ..... 55, 103

**Z**

Zeuner, M ..... 35, 53  
Zhang, J ..... 21, 29  
Zhang, N ..... 21, 25  
Zhang, X ..... 55, 87  
Zhao, W ..... 35, 41  
Zimmer, M ..... 111, 113  
Zipperian, T ..... 111, 129, 133