# APAC SILICIDE 2016 PROGRAM

**(updated 2016/6/15)**

## 16th July

13:00—13:10 *Opening address*, Takashi Suemasu, Chairman APAC-SILICIDE 2016

**Session I: Plenary**

13:10—14:10 **[16-PM-I-1]** ***Plenary***
Novel Growth-Techniques of Group-IV Based Semiconductors on Insulator for Post-Scaling Devices
Masanobu Miyao and Taizoh Sadoh
*Department of Electronics, Kyushu University, Japan*

14:10—14:40 **[16-PM-I-2]** ***Invited***
Two-Dimensional Silicon Nanosheets; Controllable Exfoliation and Exploration of Functionality
Hideyuki Nakano
*Toyota Central R&D Labs., Inc., Japan*

**Break 14:40—15:00**

**Session II: Silicide Basics**

15:00—15:30 **[16-PM-II-1]** ***Invited***
Structure and Electronic Properties of Low Dimensional Semiconducting Barium and Calcium Silicides
Dmitri B. Migas, Andrew B. Filonov, Vladislav O. Bogorodz, Victor E. Borisenko
*Belarusian State University of Informatics and Radioelectronics, Belarus*

15:30—15:50 **[16-PM-II-2]**
Electronic and Optical Properties of $BaSi_2$
Motoharu Imai, Mukesh Kumar and Naoto Umezawa
*National Institute for Materials Science, Japan*

15:50—16:10 **[16-PM-II-3]**
Synthesis of Crystalline Si-based Nanosheets by Extraction of Ca atoms from $CaSi_2$ in Inositol Hexakisphosphate (IP6) Solution
Xiang Meng[1], Kenta Sasaki[2], Koki Sano[2], Peiling, Yuan[1], Hirokazu Tatsuoka[3]
[1]*Graduate School of Science and Technology, Shizuoka University, Japan*
[2]*Graduate School of Engineering, Shizuoka University, Japan*
[3]*Graduate School of Integrated Science and Technology, Shizuoka University, Japan*

16:10—16:30 **[16-PM-II-4]**
Low-Temperature Formation of Position-Controlled Large-Grain Ge on Insulator by Gold-Induced Crystallization Combined with Localized Nucleation
Taizoh Sadoh, Rikuta Aoki, Takahiro Tanaka, and Masanobu Miyao
*Kyushu University, Department of Electronics, Japan*

16:30—16:50 **[16-PM-II-5]**

Phase Composition Evolution of Iron Silicide Nanocrystallites in the Course of Embedding into Silicon

Evgeniy A. Chusovitin[1,] Alexander V. Shevlyagin[1], Dmitry L. Goroshko[1,2], Sergey A. Dotsenko[1,2], Nikolay G. Galkin[1,2] and Anton K. Gutakovskii[3]

[1] *Institute of Automation and Control Processes FEB RAS, Russia*

[2] *Far Eastern Federal University, Russia*

[3] *Novosibirsk State University, Russia.*

17:00— 19:00 **Banquet**

# 17th July

**Session III: Nano-Silicides & Silicide Spitronics**

8:50— 9:20 **[17-AM-III-1]** ***Invited***

Metal Silicide Nanowires for Detection and Manipulation of Magnetic Skyrmions

Matthew John Stolt and Song Jin

*Department of Chemistry University of Wisconsin-Madison , USA*

9:20— 9:40 **[17-AM-III-2]**

Spin Valve Junctions Comprising Fe-Si Materials

Tsuyoshi Yoshitake[1], Kazutoshi Nakashima[1], Kazuki Kudo[1], Kazuya Ishibashi[1], Yuki Asai[1], Ken-ichiro Sakai[2], and Hiroyuki Deguchi[3]

[1] *Department of Applied Science for Electronics and Materials, Kyushu University, Japan*

[2] *Dept. of Control and Information Sys. Eng., Nat. Inst. of Techn., Kurume Coll., Japan*

[3] *Dept. of Basic Sci., Kyushu Inst. of Techn., Japan*

9:40— 10:00 **[17-AM-III-3]**

Formation of $Fe_3Si$-Nanodots on Ultrathin $SiO_2$ Induced by $H_2$-plasma Treatment and Their Magnetic-Field Dependent Electron Transport Properties

Hai Zhang, Katsunori Makihara, Mitsuhisa Ikeda, Akio Ohta and Seiichi Miyazaki

*Graduate School of Engineering, Nagoya University, Japan*

10:00—10:20 **[17-AM-III-4]**

Growth, Structure, Interfaces and Properties of Three-Layers Si(111)/[Fe-rich Silicide]/[Si-rich Silicide]/[Fe-rich Silicide]

A. Gouralnik[1], E. Pustovalov[2], Ko-Wei Lin[3], A. Chuvilin[4,5], S. Chusovitina[1,2], S. Dotsenko[1], N. Galkin [1,2], A. Cherednichenko[6] and V. Plotnikov[2]

[1] *Institute of Automation and Control Properties FEB RAS, Russia*

[2] *Far-Eastern Federal University, Physics Dpt., Russia*

[3] *Department of Materials Sci. and Eng., National Chung Hsing University, Taiwan*

[4] *CIC NanoGUNE Consolider, Tolosa Hiribidea , Spain*

[5] *Ikerbasque, Basque Foundation for Science, Alameda Urquijo, Spain*

[6] *Institute of Chemistry FEB RAS, Russia*

**Break 10:20—10:40**

**Session IV: Silicide Green Technology; Thermoelectrics**

10:40—11:10 **[17-AM-IV-1]** ***Invited***

Recent Advances in Thermoelectric Silicides

Daryoosh Vashaee

*Department of Electrical and Computer Engineering, Monteith Research Center, North Carolina State University, USA*

11:10—11:30 **[17-AM-IV-2]**

The Enhancement of Power Factor of MnSiγ/AlMnSi Mutilayer

Akinori Nishide, Yosuke Kurosaki, Shin Yabuuchi and Jun Hayakawa
*Hitachi Ltd., R&D group, Center for exploratory Research, Japan*

11:30—11:50 **[17-AM-IV-3]**

Influence of Mg-Related Defects on Structural and Electronic Properties of $Mg_2Si$

Naomi Hirayama, Iida Tsutomu, Keishi Nishio, Yasuo Kogo, Yoshifumi Takanashi, and Noriaki Hamada
*Tokyo University of Science, Japan*

11:50—12:10 **[17-AM-IV-4]**

Preparation of $Mg_2Si$ Thin Films on Various Kinds of Substrates and their Thermoelectric Properties

Mao Kurokawa[1], Mutsuo Uehara[1], Daichi Ichinose[1,2], Takao Shimizu[3],Kensuke Akiyama[1,4] , Masaaki Matsushima[1] , Hiroshi Uchida[5] , Yoshisato Kimura[2], Hiroshi Funakubo [1,2,3]
*[1] Department of Innovative and Engineered Materials, Tokyo Institute of Technology, Japan*
*[2] School of Materials and Chemical Technology, Tokyo Institute of Technology, Japan*
*[3] Materials Research Center for Element Strategy, Tokyo Institute of Technology, Japan*
*[4] Kanagawa Industrial Technology Center, Japan*
*[5] Department of Materials and Life Science, Sophia University, Japan*

**Lunch Break 12:10—13:30**

**Session V: Silicide Green Technology; Photovoltaics**

13:30—14:00 **[17-PM-V-1]** ***Invited***

Group IV Clathrates Developed for Photovoltaics

Tetsuji Kume[1], Fumitaka Ohashi[1], Kentaro Sakai[2,] Atsuhiko Fukuyama[3], Motoharu Imai[4], Haruhiko Udono[5], Takayuki Ban[1], Hitoe Habuchi[6], Hidetoshi Suzuki[3], Tetsuo Ikari[3], and Shuichi Nonomura[1]
*[1] Faculty of Engineering, Gifu University, Japan*
*[2] Center for Collaborative Research & Community Cooperation, University of Miyazaki, Japan*
*[3] Faculty of Engineering, University of Miyazaki, Japan*
*[4] National Institute for Materials Science, Japan*
*[5] Graduate school of Science and Engineering, Ibaraki University, Japan*
*[6] Department of Electrical and Computer Engineering, National Institute of Technology, Gifu College, Japan*

14:00—14:20 **[17-PM-V-2]**

Investigation of p-type Emitter Layer Materials for Heterojunction Barium Silicide Thin Film Solar Cells

Kazuma Takahashi[1], Yoshihiko Nakagawa[1], Kosuke O. Hara[2], Yasuyoshi Kurokawa[1], Noritaka Usami[1]
*[1] Graduate School of Engineering, University of Nagoya, Japan*
*[2] Center for Crystal Science and Technology, University of Yamanashi, Japan*

14:20—14:40 **[17-PM-V-3]**

Fabrication of B-doped p-$BaSi_2$ on n-Ge(111) Substrates for Heterojunction Solar Cells

Ryota Takabe, Suguru Yachi, Daichi Tsukahara, Kaoru Toko and Takashi Suemasu
*Institute of Applied Physics, University of Tsukuba, Japan*

14:40—15:00 **[17-PM-V-4]**

The Growth of Polycrystalline Orthorhombic $BaSi_2$ on Ge Substrate by Vacuum Evaporation Method

Cham Thi Trinh[1], Yoshihiko Nakagawa[1], Kosuke O. Hara[2], Ryota Takabe[3], Takashi Suemasu[3], and Noritaka Usami[1]

[1] *Graduate school of Engineering, Nagoya University, Japan*

[2] *Center for Crystal Science and Technology, University of Yamanashi, Japan*

[3] *Institute of Applied Physics, University of Tsukuba, Japan*

15:00—15:20 **[17-PM-V-5]**

Proposal of a Method to Realize $BaSi_2$ Thin Films with Uniform Orientation using Reactivity of Excessive Ba in the Film and Si Substrate in Vacuum Evaporation

Yoshihiko Nakagawa[1], Cham Thi Trinh[1], Kosuke O. Hara[2], Yasuyoshi Kurokawa[1], Takashi Suemasu[3] and Noritaka Usami[1]

[1] *Graduate School of Engineering, Nagoya University, Japan*

[2] *Center for Crystal Science and Technology, University of Yamanashi, Japan*

[3] *Institute of Applied Physics, University of Tsukuba, Japan*

15:20—15:40 **[17-PM-V-6]**

Post -Annealing Effects on $BaSi_2$ Evaporated Films Grown on Si Substrates

Takamichi Suhara[1], Koichi Murata[2], Aryan Navabi[2], Kosuke O. Hara[3], Yoshihiko Nakagawa[1], Trinh Cham Chi[1], Yasuyoshi Kurokawa[1], Takashi Suemasu[4], Kang L. Wang[2], and Noritaka Usami[1]

[1] *Graduate School of Engineering, Nagoya University, Japan*

[2] *Department of Electrical Engineering, University of California, Los Angeles, USA*

[3] *Center for Crystal Science and Technology, University of Yamanashi, Japan*

[4] *Institute of Applied Physics, University of Tsukuba, Japan*

**Break 15:40—16:00**

16:00—17:30 **Poster Session I**

17:30—19:00 **Poster Session II**

# 18th July

**Session VI: Thin film growth, Electric and Optical Properties, Silicide Devices**

8:50— 9:20 **[18-AM-VI-1]** ***Invited***

The Prospects for Silicon-Silicide Integrated Photonics

N.G. Galkin[1,2], A.V. Shevlyagin[1], D.L. Goroshko[1,2], E.A. Chusovitin[1], K.N. Galkin[1]

[1] *Institute of Automation and Control Processes, FEB RAS, Russia*

[2] *Far Eastern Federal University, School of Natural Sciences, Russia*

9:20—9:40 **[18-AM-VI-2]**

Room-Temperature Luminescent Properties of the Si/$\beta$-$FeSi_2$ Nanocrystals/Si LED

A.V. Shevlyagin[1], T.S. Shamirzaev[2,3,4], A.K. Gutakovskii[2,3], K.N. Galkin[1], E.A. Chusovitin[1], D.L. Goroshko[1,5] and N.G. Galkin[1,5]

[1] *Institute of Automation and Control Processes FEB RAS, Russia*

[2] *Rzhanov Institute of Semiconductor Physics, SB RAS, Russia*

[3] *Novosibirsk State University, Russia*

[4] *Ural Federal University, Russia*

[5] *Far Eastern Federal University, Russia*

9:40—10:00 **[18-AM-VI-3]**

Analysis of Oxidation Behavior in Nanocrystal β-$FeSi_2$/Si Composites by Rutherford Backscattering Spectrometry and Computation of Diffusion Flux

Mikihiro Arima[1], Masaya Fuchi[1], Kazumasa Narumi[2], and Yoshihito Maeda[1,2]

[1] *Department of Computer Science and Electronics, Kyushu Institute of Technology, Japan*

[2] *National Institutes for Quantum and Radiological Science and Technology(QST), Japan*

10:00— 10:20 **[18-AM-VI-4]**

Relaxation of Thermal Quenching of Photoluminescence from Nanocrystal β-$FeSi_2$/$SiO_2$ composites

Yoshihito Maeda

*Department of Computer Science and Electronics, Kyushu Institute of Technology, Japan*

**Break 10:20—10:40**

10:40—11:00 **[18-AM-VI-5]**

Optical Constants of Sputtered $FeSi_2$ Thin Films – Applications to Solar and Thermal Radiation Control

Motofumi Suzuki, Shoma Masunaka, Kensuke Nishiura and Kyoko Namura

*Department of Micro Engineering, Kyoto University, Japan*

11:00—11:20 **[18-AM-VI-6]**

Structural and electrical properties of β-$FeSi_2$ polycrystalline films with low electron density

Kazuya Ogi[1], Takahiko Higashi[2], Shuya Ikeda[1],Tetsu Hattori[2] and Yoshikazu Terai[1]

[1] *Department of Computer Science and Electronics, Kyushu Institute of Technology, Japan*

[2] *Graduate School of Science and Engineering, Kagoshima University, Japan*

11:20— 11:40 **[18-AM-VI-7]**

Temperature-Dependent Magnetoresistance Effects in $Fe_3Si$/$FeSi_2$/$Fe_3Si$ Trilayered Spin Valve Junctions

Kazuki Kudo[1], Kazuya Ishibashi[1], Kazutoshi Nakashima[1], Yuki Asai[1], Ken-ichiro Sakai[2], Hiroyuki Deguchi[3], and Tsuyoshi Yoshitake[1]

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[2] *Department of Control and Information Systems Engineering, National Institute of Technology, Kurume College, Japan*

[3] *Department of Basic Sciences, Kyushu Institute of Technology, Japan*

11:40—12:00 **[18-AM-VI-8]**

Impact of $Mg_2Si$ Thin Film on Absorption and Efficiency of a-Si:H Based Solar Cells

I. M. Chernev[1], A. V. Shevlyagin[1], K. N. Galkin[1], J. Stuchlik[2], Z. Remes[2], T.H. Stuchlikova[2], R. Fajgar[3] and N. G. Galkin[1,4]

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12:15—12:30 **Closing and Ceremony**