PROGRAM

The Forum on the Science and Technology of Silicon Materials 2003
Nov. 25 (Tue.)- 27 (Thu.)

Registration Desk Opening : Nov. 25, 11 a.m.

Nov. 25, Tue.

A. General
   1. Impact of basic research of crystal defects on silicon material technology
      K. Sumino
      Prof. Emeritus, Tohoku University
      13:00-13:45

B. Quality and Technology Required for the Wafers in the Coming Generation
   2. Wafer quality requirements from the next generation processes and devices
      Tetsuo Fukuda, Seiichiro Kobayashi, and Masanori Yoshise
      Electronic Devices Group, Fujitsu Limited
      13:45-14:30

   3. Device physics and technology of strained-Si MOSFETs
      S. Takagi, T. Tezuka, N. Sugiyama, T. Mizuno, T. Numata, Y. Moriyama,
      K. Usuda, S. Nakahara, J. Koga, A. Tanabe, N. Hirashita and *T. Maeda
      MIRAI Project,
      Association of Super-Advanced Electronics Technology (ASET),
      *National Institute of Advanced Industrial Science and Technology (AIST)
      14:30-15:15

   Coffee Break
      15:15-15:30

C. Production Wafers Tomorrow: Epitaxial and Annealed Wafers
   4. Improvement of Si substrate properties by nitrogen doping
      Andreas Huber
      Wacker Siltronic, R&D group
      15:30-16:15

   5. The control of grown-in defect in nitrogen-doped Czochralski-grown silicon for
      the application to annealed wafer and epitaxial wafer
      Katsuhiko Nakai, Yasumitsu Ohta, Hideki Yokota, Atsushi Ikari, and
      Masahiro Tanaka
      Wacker NSCE Corporation
      16:15-16:45

   6. Epitaxial silicon wafers with high gettering capability for low temperature device processing
      Yasumitsu Ohta, Katsuhiko Nakai, Koichi Kitahara, and Atsushi Ikari
      Wacker NSCE Corp.
      16:45-17:15
7. Gettering of metallic impurities in silicon (title tentative)
   A.A. Istratov
   University of California, Berkeley
   17:15-18:00

Free Time
18:00-18:30

Banquet
18:30-20:30

Surfside Refreshment I: Hayama Marina
20:30-(optional)

Nov. 26, Wed.

---

D. Gettering, Oxygen Precipitation, Passivation of Defects

8. Internal gettering of metal impurities by oxide precipitates: Current status and physical modeling of gettering
   Koji Sueoka
   Department of System Engineering, Okayama Prefectural University
   08:30-09:00

9. Substrate-boron-optimized epi-wafer without backside SiO₂ seal (p/p₀ epi-wafer): Simultaneous achievement of high gettering ability by boron and reduction of in-process boron contamination
   K. Tanahashi, H. Yamada-Kaneta, *T. Fukuda, and *H. Mori
   Fujitsu Laboratories Ltd., *Fujitsu Ltd.
   09:00-09:30

10. Tuning oxygen concentration at low- and high-temperature IG process and boron concentration in epitaxial wafer for the gettering of metal impurities
    Mohammad B. Shabani,* Y. Shiina, and Y. Shimanuki
    Sumitomo Mitsubishi Silicon Corp.
    09:30-10:00

    Coffee Break
    10:00-10:15

11. High-sensitivity determination of copper in silicon crystal by photoluminescence and the structure of the copper PL center
    Minoru Nakamura and Susumu Murakami
    Hitachi Research Laboratory, Hitachi, Ltd.
    10:15-10:45

12. Gettering technique for the cutting-edge LSI manufacturing
    Nobuyoshi Hattori, Kazuhito Matsukawa, Hideki Naruoka, and Yasuhiro Kimura
    Renesas Technology Corp.
    10:45-11:15

13. Defect passivation by cyanide treatment and improvement of silicon device characteristics
    Hikaru Kobayashi, Osamu Maida, and Masao Takahashi
    Institute of Scientific and Industrial Research, Osaka University, and CREST,
    Japan Science and Technology Corporation
    11:15-11:45
E. Light-mass Element Impurities and Intrinsic Point Defects

14. Optical properties of oxygen precipitates and dislocations in silicon
   Simona Binetti
   *INFM and Department of Material Science*
   *University of Milano-Bicoca*  
   13:30-14:15

15. Study of N-doping effect on Si crystal growth by first-principles calculations combined with thermodynamical theory
   Hiroyuki Kageshima, Akihito Taguchi, and *Kazumi Wada
   NTT Basic Research Laboratories
   *Massachusetts Institute of Technology*  
   14:15-14:45

16. Observation of latent defects in Si using positron annihilation spectroscopy
   Fuminobu Hori¹, Satoko Nakagawa¹ and Ryuichiro Oshima¹²
   ¹Research Institute for Advanced Science & Technology,
   Osaka Prefecture University
   ²Osaka Nuclear Science Association  
   14:45-15:15

Coffee Break  
15:15-15:30

F. 3-min INTRODUCTIONS FOR POSTERS  
16:30-18:00

Dinner  
18:00-19:30

G. POSTER SESSION  
19:30-21:30

Surfside Refreshment II: Chojagasaki Beach  
(optional)

Nov. 27, Thu.

H. SOI Wafer Technologies and Strained Silicon Wafers

19. SOI – current status and trend in the future
   Atsushi Ogura
   NEC Corporation, Silicon Systems Research Laboratories  
   09:00-09:30
20. Recent progress in SIMOX wafer technology for LSIs fabricated with internal-thermal-oxidation (ITOX) process
Tsutomu Sasaki, Keisuke Kawamura, Seiji Takayama, Tetsuo Maeda, Yoichi Nagatake, and Atsuki Matsumura

Wacker NSCE Corporation 09:30-10:00

21. Vacancy-type defects in SOI wafers probed by a monoenergetic positron beam
A. Uedono¹, A. Ogura², N. Hattori², J. Kudo², and T. Nishikawa²

Institute of Applied Physics, University of Tsukuba¹, STARC² 10:00-10:30

Coffee Break 10:30-10:45

22. Photoluminescence characterization of defects in superficial layers of SOI wafers
Michio Tajima

Institute of Space and Astronautical Science 10:45-11:15

23. Evaluation and control of electrically active defects in strained-silicon wafer
Hiroshi Nakashima

Advanced Science and Technology Center for Cooperative Research, Kyushu University 11:15-11:45

24. Efficient emission from erbium in strained silicon
Yoichi Kamiura, Takeshi Ishiyama, Mamoru Yoshida, and Yoshifumi Yamashita

Faculty of Engineering, Okayama University 11:45-12:15

Lunch 12:15-13:30

I. Breakthroughs for Future Silicon Devices and New Material Design

25. Phonon and spin engineering in silicon
Kohei M. Itoh

Keio University and CREST-JST 13:30-14:15

26. An investigation of thermal conductivity of isotope silicon and its application to crystal growth
Koichi Kakimoto, Atsushi Murakawa, and Hideo Ishii

Research Institute for Applied Mechanics, Kyushu University 14:15-15:00

27. Materials design of silicon based spintronics materials
H. Katayama-Yoshida

Institute of Scientific and Industrial Research, Osaka University 15:00-15:45

Closing Remarks
H. Yamada-Kaneta

Fujitsu Laboratories Ltd. 15:45-16:00