

Wednesday 23 January

SESSION 7

Room: Marriott Hotel: San Jose Ballroom Salon I . . . Wed. 8:40 to 10:00 am

Fiber Communication

Session Chair: Trevor Mark Benson,  
The Univ. of Nottingham (United Kingdom)

- 8:40 am: **Noise reduction for fiber optic NTSC signal transmission**, Furukawa Rei, Keiji Uehara, Keio Univ. (Japan); Satoshi Takahashi, Akihiro Tagaya, Japan Science and Technology Agency (Japan); Yasuhiro Koike, Keio Univ. (Japan) . . . . . [6896-29]
- 9:00 am: **Cost effective optical coupling for enhanced rate polymer optical fiber communication**, Jayakrishnan Chandrappan, Institute of Microelectronics (Singapore) . . . . . [6896-30]
- 9:20 am: **A novel modulation format based on the change of an optical spectrum shape**, Alexander V. Shamray, Alexander Kozlov, Igor Ilichev, Mikhail P. Petrov, A.F. Ioffe Physico-Technical Institute (Russia) . . . . . [6896-31]
- 9:40 am: **Effect of extrinsic perturbation by transverse pressure, bending and tension birefringence**, Chandrakant M. Jadhao, G.S. College of Khamgaon (India); Deepak S. Dhote, Brijlal Biyani Science College of Amravati (India) . . . . . [6896-32]
- Coffee Break . . . . . 10:00 to 10:30 am

SESSION 8

Room: Marriott Hotel:  
San Jose Ballroom Salon I . . . . . Wed. 10:30 am to 12:30 pm

Integration Concepts

Session Chair: Yakov Sidorin, Photineer Technology Group

- 10:30 am: **III-V silicon heterogeneous integration for integrated transmitters and receivers (Invited Paper)**, Dries Van Thourhout, IMEC (Belgium) . . . . . [6896-33]
- 11:00 am: **Monolithic integration of the direct band gap material Ga(NAsP) on Si substrate**, Bernardette Kunert, Igor Nemeth, Timothy B. Adams, Kerstin Volz, Wolfgang Stolz, Philipps-Univ. Marburg (Germany) . . . . . [6896-34]
- 11:20 am: **Design, fabrication and integration of glass waveguides on a silicon platform**, Juejun Hu, Massachusetts Institute of Technology; Nathan Carlie, Clemson Univ.; Ning-Ning Feng, Massachusetts Institute of Technology; Laetitia Petit, Clemson Univ.; Anuradha Agarwal, Massachusetts Institute of Technology; Kathleen Richardson, Clemson Univ.; Lionel Kimerling, Massachusetts Institute of Technology. . . . . [6896-35]
- 11:40 am: **SiON, SiO<sub>2</sub>/Ge and triplex technologies for large-scale integration circuits: a comparison**, Andrea Melloni, Francesco Morichetti, Raffaella Costa, Giuseppe Cusmai, Politecnico di Milano (Italy) . . . . . [6896-36]
- 12:00 pm: **Hybrid and monolithic planar light wave circuits (Invited Paper)**, Ray T. Chen, The Univ. of Texas at Austin . . . . . [6896-37]
- Lunch/Exhibition Break . . . . . 12:30 to 2:00 pm

SESSION 9

Room: Marriott Hotel: San Jose Ballroom Salon I . . . . . Wed. 2:00 to 3:30 pm

Measurement and Sensorics I

Session Chair: Xudong Fan, Univ. of Missouri/Columbia

- 2:00 pm: **Polymer microring resonators and their sensor applications (Invited Paper)**, L. Jay Guo, Univ. of Michigan . . . . . [6896-38]
- 2:30 pm: **Temperature insensitive refractometer with open top ridge waveguides**, Xiaoli Dai, Communications Research Ctr. Canada (Canada) . . . . . [6896-39]
- 2:50 pm: **Integrated Raman spectroscopy**, Jorg Hubner, Danmarks Tekniske Univ. (Denmark); Thomas A. Anhoj, Serstech AB (Sweden); Sarah Pedersen, Danmarks Tekniske Univ. (Denmark); Dan A. Zauner, Ignis Photonix A/S (Denmark); Anders M. Jorgensen, AllSun A/S (Denmark); Gabriela Blagoi, Ole Hansen, Danmarks Tekniske Univ. (Denmark) . . . . . [6896-40]
- 3:10 pm: **Miniaturized opto-fluidic ring resonator for sensitive label-free viral detection**, Hongying Zhu, Ian M. White, Jonathan D. Suter, Univ. of Missouri/Columbia; Mohammed Zourob, Biophage Pharma Inc. (Canada); Xudong Fan, Univ. of Missouri/Columbia . . . . . [6896-41]
- Coffee Break . . . . . 3:30 to 4:00 pm

- 11:40 am: **Ultra-compact silicon-on-insulator waveguide microspectrometer with sub-wavelength gratings**, Przemek J. Bock, Univ. of Ottawa (Canada) and National Research Council Canada (Canada); Pavel Cheben, Siegfried Janz, Dan-Xia Xu, National Research Council Canada (Canada); Trevor J. Hall, Univ. of Ottawa (Canada). . . . . [6896-17]
- 12:00 pm: **Waveguide Bragg gratings with tailored spectral chirps induced by tapered core profiles**, Min-Su Kim, Jung-Jin Ju, Seung-Koo Park, Electronics and Telecommunications Research Institute (South Korea); Myung-Hyun Lee, Sungkyunkwan Univ. (South Korea). . . . . [6896-18]
- Lunch/Exhibition Break . . . . . 12:20 to 1:30 pm

SESSION 5

Room: Marriott Hotel: San Jose Ballroom Salon I . . . . . Tues. 1:30 to 3:00 pm

Plasmonics

Session Chair: Pierre Berini, Univ. of Ottawa (Canada)

- 1:30 pm: **Plasmonics: catalyzing a revolution in chip technology (Invited Paper)**, Mark L. Brongersma, Stanford Univ. . . . . [6896-19]
- 2:00 pm: **Surface plasmon-polariton mode amplification in long-range waveguides**, Israel De Leon, Pierre Berini, Univ. of Ottawa (Canada). . . . . [6896-20]
- 2:20 pm: **Gain-induced switching in metal-dielectric-metal plasmonic waveguides**, Zongfu Yu, Georgios Veronis, Mark L. Brongersma, Shanhui Fan, Stanford Univ. . . . . [6896-21]
- 2:40 pm: **Waveguide-ring resonator-based photonic components utilizing channel plasmon polaritons**, Valentyn S. Volkov, Sergey I. Bozhevolnyi, Aalborg Univ. (Denmark) . . . . . [6896-22]
- Coffee Break . . . . . 3:00 to 3:30 pm

SESSION 6

Room: Marriott Hotel: San Jose Ballroom Salon I . . . . . Tues. 3:30 to 5:40 pm

Ring Resonators

Session Chair: Gualtiero Nunzi-Conti, Istituto di Fisica Applicata Nello Carrara (Italy) and Centro Studi e Ricerche Enrico Fermi (Italy)

- 3:30 pm: **The emerging field of optomechanics (Invited Paper)**, Kerry J. Vahala, California Institute of Technology. . . . . [6896-23]
- 4:00 pm: **Linear and nonlinear control of polarization state using microring**, Gennady Shvets, Chris R. Fietz, The Univ. of Texas at Austin . . . . . [6896-24]
- 4:20 pm: **Development of versatile waveguide-coupled optofluidic microring resonator devices**, Ian M. White, Scott Lacey, John Gohring, Xudong Fan, Univ. of Missouri/Columbia . . . . . [6896-25]
- 4:40 pm: **Tunable ring resonators for silicon Raman laser and amplifier applications**, Jonathan Doyle, Oded Cohen, Mindy Lee, Omri Raday, Shengbo Xu, Vanessa Sih, Haisheng Rong, Mario Paniccia, Intel Corp. [6896-26]
- 5:00 pm: **Waferbonded active/passive vertically coupled microring lasers**, Michael Hamacher, Helmut Heidrich, Ute Troppenz, Fraunhofer-Institut für Nachrichtentechnik Heinrich-Hertz-Institut (Germany); Dimitris Syvridis, Dimitris Alexandropoulos, Spyros Mikroulis, Alexandros Kapsalis, Univ. of Athens (Greece); Chyng Wen Tee, Kevin Williams, Univ. of Cambridge (United Kingdom); Viorel Dragoi, EV Group E. Thallner GmbH (Austria); Marin Alexe, Max-Planck-Institut für Mikrostrukturphysik (Germany); Dana Christea, Mihai Kusko, National Institute for Research and Development in Microtechnologies (Romania) . . . . . [6896-27]
- 5:20 pm: **Simulation of integrated coupled nonlinear microring resonators all-optical pulse restorer**, Yannick Dumeige, Laura Ghisa, Ngan Nguyen Thi Kim, Patrice Féron, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France). . . . . [6896-28]

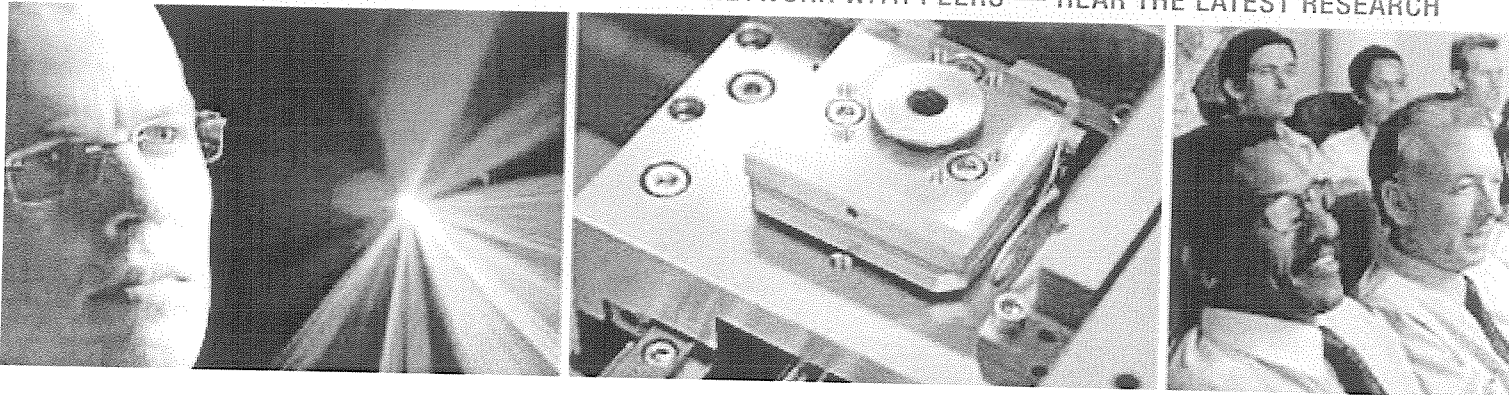


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**Abstract:** Silicon is excellent material for realizing compact nanophotonic ICs operating at wavelengths in the telecom range. Moreover, the desired circuits can be realized with the most advanced equipment available, used also for the fabrication of high-end electronic circuits. Efficient light emission and amplification directly from silicon remains a bottleneck however. Therefore, we developed an alternative approach, based on the heterogeneous integration of III-V epitaxial material and silicon nanophotonic circuits. Following fabrication and planarization of the latter, small unprocessed dies of InP-based epitaxial material are bonded on top. Next, the substrate of these dies is removed down to an etch stop layer. Finally the desired active optoelectronic devices are processed in the remaining III-V layers using waferscale processes. The critical alignment between the sources and the underlying nanophotonic circuits is ensured through accurate lithography. In this paper we review some recent devices fabricated through this integration process.

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