

Technical Program

SPIE **Photonics**
WEST

20-25 January 2007

San Jose Convention Center
San Jose, California USA



Advanced Optical and Quantum Memories and Computing IV

Conference Chairs: **Zameer U. Hasan**, Temple Univ.; **Alan E. Craig**, Montana State Univ.-Bozeman; **Selim M. Shahriar**, Northwestern Univ.; **Hans J. Coufal**, IBM Corp.

Program Committee: **Richard I. Epstein**, Los Alamos National Lab.; **Philip R. Hemmer**, Texas A&M Univ.; **M. Saif Islam**, Univ. of California/Davis; **Demetri Psaltis**, California Institute of Technology; **M. Suhail Zubairy**, Texas A&M Univ.

Wednesday 24 January

SESSION 1

Room: Conv. Ctr. Room M Wed. 8:00 to 10:00 am

Advanced Optical Memories and Processors

Chair: **Hans J. Coufal**, IBM Corp.

8:00 am: **Time-domain processing of information carried by ultrashort pulses** (*Invited Paper*), R. E. Saperstein, Univ. of California/San Diego; D. Panasenko, Lawrence Berkeley National Lab.; K. A. Tetz, Univ. of California/San Diego; R. I. Rokitski, Cymer Corp.; Y. Fainman, Univ. of California/San Diego [6482-01]

8:30 am: **The homogeneous dispersive lineshape as a wavelet basis** (*Invited Paper*), A. E. Craig, Montana State Univ./Bozeman [6482-02]

9:00 am: **Fabrication and plasma spectroscopy of PLD thin film deposition system for power-gated holeburning** (*Invited Paper*), F. Bezares, Z. U. Hasan, Temple Univ. [6482-03]

9:30 am: **Sluggish-light based true-time-delay multiple beam-forming system for broadband RF phased-array antennas** (*Invited Paper*), L. Gao, S. I. Herriot, K. H. Wagner, Univ. of Colorado/Boulder [6482-04]

Coffee Break 10:00 to 10:30 am

SESSION 2

Room: Conv. Ctr. Room M Wed. 10:30 am to 12:20 pm

Quantum Computing: Materials and Methods

Chair: **Alan E. Craig**, Montana State Univ./Bozeman

10:30 am: **Scalable quantum computing in diamond** (*Invited Paper*), P. R. Hemmer, Texas A&M Univ.; F. Jelezko, J. Wrachtrup, Univ. Stuttgart (Germany); P. Tamarat, Univ. Bordeaux I (France); S. D. Prawer, The Univ. of Melbourne (Australia); M. D. Lukin, Harvard Univ. [6482-05]

11:00 am: **Photonic quantum information processing in diamond** (*Invited Paper*), C. M. Santori, S. M. Spillane, D. Fattal, R. G. Beausoleil, Hewlett-Packard Labs.; J. R. Rabeau, P. Olivero, A. D. Greentree, S. D. Prawer, The Univ. of Melbourne (Australia) [6482-06]

11:30 am: **Micro-characterization of spectral memory materials using nuclear forward scattering** (*Invited Paper*), A. Konjhodzic, Z. U. Hasan, Temple Univ.; E. E. Alp, Argonne National Lab. [6482-07]

12:00 pm: **High efficiency DOEs at large diffraction angles for quantum information and computing architectures**, A. A. Cruz-Cabrera, Sandia National Labs. Legal Organizations; S. A. Kemme, J. R. Wendt, Sandia National Labs.; T. R. Carter, S. Samora, L&M Technologies [6482-08]

Lunch/Exhibition Break 12:20 to 1:30 pm

SESSION 3

Room: Conv. Ctr. Room M Wed. 1:30 to 3:00 pm

Memories and Methods for Advanced Computing

Chair: **Zameer U. Hasan**, Temple Univ.

1:30 pm: **Optimizing two-photon optical storage in the presence of hot band absorption** (*Invited Paper*), N. S. Makarov, A. Rebane II, M. A. Drobizhev, Montana State Univ./Bozeman; H. Wolleb, H. Spahn, Ciba Specialty Chemicals (Switzerland) [6482-09]

2:00 pm: **Design and implementation of all-optical half adder using cross gain modulation in semiconductor optical amplifiers**, S. H. Kim, Korea Institute of Science and Technology (South Korea); J. H. Kim, Korea Institute of Science and Technology (South Korea) and Pennsylvania State Univ.; C. W. Son, G. C. Kim, Y. T. Byun, Y. M. Jhon, S. Lee, D. H. Woo, S. H. Kim, Korea Institute of Science and Technology (South Korea) [6482-10]

2:20 pm: **Secure display that limits the viewing space by use of optically decodable encryption**, H. Yamamoto, Y. Hayasaki, The Univ. of Tokushima (Japan) [6482-11]

2:40 pm: **An evolutionary path toward quantum switching architectures**, F. Toudeh-Fallah, M. Carroll, Cisco Systems, Inc.; A. Y. Oruc, Univ. of Maryland/College Park [6482-12]

Coffee Break 3:00 to 3:30 pm

SESSION 4

Room: Conv. Ctr. Room M Wed. 3:30 to 4:40 pm

Photonics in Silicon and Organic Materials

Chair: **Alex K. Rebane**, Montana State Univ./Bozeman

3:30 pm: **Erbium in silicon nanostructures**, Z. F. Krasilnik, Institute for Physics of Microstructures (Russia) [6482-13]

3:50 pm: **High directivity of subwavelength wire lasers** (*Invited Paper*), E. E. Orlova, Institute for Physics of Microstructures (Russia) [6482-14]

4:20 pm: **Acceptors in silicon for Tunable THz lasing**, E. E. Orlova, Institute for Physics of Microstructures (Russia) [6482-16]

✓ **Posters-Wednesday**

All symposium attendees are invited to attend the poster sessions provided as an opportunity to enjoy refreshments while reviewing poster papers. Each evening will represent a different set of conferences to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors. Since poster sessions are technical events and part of the conference program, it is not appropriate for spouses and families to attend these events. Attendees are requested to wear their conference registration badges to the poster sessions.

Poster presenters may post their poster papers Wednesday morning starting at 10:00 am in the Parkside Hall, and will need to remove their papers immediately following the poster session that evening. Any papers left on the boards at the close of the poster session will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of each poster session. Poster authors should be at their papers from 6:00 pm to 7:30 pm to answer questions from attendees.

- ✓ **Beam pattern investigations for terahertz quantum cascade lasers**, E. E. Orlova, Institute for Physics of Microstructures (Russia); J. N. Hovenier, T. O. Klaassen, I. Kasalynas, A. Adam, J. Gao, T. M. K. Klapwijk, Technische Univ. Delft (Netherlands); B. S. Williams, Q. Hu, Massachusetts Institute of Technology; J. L. Reno, Sandia National Labs. [6482-36]
- ✓ **Squeezing and squared-amplitude squeezing in a two-atom Jaynes-Cummings model with cavity damping and atomic dissipation**, E. K. Bashkurov, M. S. Rusakova, Samara State Univ. (Russia) [6482-37]
- ✓ **Nonblocking photonic switching for P2P self-organized optical concurrent communications network using pseudorandom numbers**, N. Oshima, Y. Nozaki, W. Sasaki, Doshisha Univ. (Japan) [6482-38]
- ✓ **Intra-center relaxation in shallow centers in silicon**, E. E. Orlova, D. V. Kozlov, A. V. Antonov, Institute for Physics of Microstructures (Russia); J. N. Hovenier, T. O. Klaassen, A. Adam, Technische Univ. Delft (Netherlands); M. S. Kagan, I. V. Altukhov, Institute of Radio Engineering and Electronics (Russia); Q. V. Nguyen, D. A. Carder, P. J. Phillips, B. Redlich, FOM-Institute for Plasma Physics (Netherlands) [6482-39]

Thursday 25 January

SESSION 5

Room: Conv. Ctr. Room M Thurs. 8:00 to 9:50 am

Applications of Slow and Fast Light I

Chair: Selim M. Shahriar, Northwestern Univ.

- 8:00 am: **Coherent interactions with atoms and molecules in photonic band-gap fibers** (*Invited Paper*), A. L. Gaeta, S. Ghosh, A. Bhagwat, C. Kyle, B. J. Kirby, Cornell Univ. [6482-18]
- 8:30 am: **Comparing slow-light properties of 10-Gbps RZ data in dispersion shifted fibers and highly nonlinear fibers based on Raman-assisted optical parametric amplification** (*Invited Paper*), Z. Hu, Tsinghua Univ. (China); D. J. Blumenthal, Univ. of California/Santa Barbara [6482-19]
- 9:00 am: **Large widely tunable fractional delays based on wavelength conversion and dispersion**, Y. Okawachi, J. E. Sharping, C. Xu, A. L. Gaeta, Cornell Univ. [6482-20]
- 9:20 am: **Tunable slow light in Bragg-spaced quantum wells** (*Invited Paper*), J. P. Prineas, A. L. Smirl, The Univ. of Iowa; R. H. Binder, The Univ. of Arizona [6482-21]
- Coffee Break 9:50 to 10:10 am

SESSION 6

Room: Conv. Ctr. Room M Thurs. 10:10 am to 12:00 pm

Applications of Slow and Fast Light II

Chair: Philip R. Hemmer, Texas A&M Univ.

- 10:10 am: **Demonstration of interferometer sensitivity varying as the inverse of the group index** (*Invited Paper*), M. S. Shahriar, G. S. Pati, M. Messal, Northwestern Univ. [6482-22]
- 10:40 am: **Optimization of slow and stored light in atomic vapor** (*Invited Paper*), I. Novikova, D. F. Phillips, M. Klein, R. L. Walsworth, Harvard-Smithsonian Ctr. for Astrophysics [6482-23]
- 11:10 am: **Demonstration of a white light interferometer using fast light**, G. S. Pati, M. Messal, M. Shahriar, Northwestern Univ. [6482-24]
- 11:30 am: **Large fractional displays in a hot vapor** (*Invited Paper*), R. M. Camacho, M. V. Pack, R. W. Boyd, J. C. Howell, Univ. of Rochester [6482-25]
- Lunch/Exhibition Break 12:00 to 1:00 pm

SESSION 7

Room: Conv. Ctr. Room M Thurs. 1:00 to 3:20 pm

Applications of Slow and Fast Light III

Chair: Alexander L. Gaeta, Cornell Univ.

- 1:00 pm: **Rubidium spectroscopy on a chip** (*Invited Paper*), H. Schmidt, Univ. of California/Santa Cruz [6482-26]
- 1:30 pm: **Coherent few-photon quantum transport in one-dimensional systems** (*Invited Paper*), J. Shen, S. L. Fan, Stanford Univ. [6482-27]
- 2:00 pm: **Designing optimal gain profiles for slow-light applications** (*Invited Paper*), R. Pant, Consultant; M. D. Stenner, M. A. Neifeld, The Univ. of Arizona [6482-28]
- 2:30 pm: **Subluminal and superluminal propagation of an optical pulse in an active Raman gain medium**, L. Deng, National Institute of Standards and Technology [6482-29]
- 2:50 pm: **Electromagnetically induced backscattering via slow light** (*Invited Paper*), Y. V. Rostovtsev, M. O. Scully, Texas A&M Univ. [6482-30]
- Coffee Break 3:20 to 3:40 pm

SESSION 8

Room: Conv. Ctr. Room M Thurs. 3:40 to 5:10 pm

Applications of Slow and Fast Light IV

Chair: Shanhui L. Fan, Stanford Univ.

- 3:40 pm: **Ultralow-light level saturation spectroscopy and EIT using a tapered fiber in a hot vapor cell**, G. S. Pati, M. Shahriar, P. Kumar, Northwestern Univ.; S. M. Spillane, R. G. Beausoleil, Hewlett-Packard Labs. [6482-32]
- 4:00 pm: **Slow wave atom interferometers for rotation sensing**, M. Ozcan, Sabanci Univ. (Turkey) [6482-33]
- 4:20 pm: **An optical prism based on resonance ultradispersive media**, V. A. Sautenkov, Y. V. Rostovtsev, M. O. Scully, Texas A&M Univ. [6482-34]
- 4:40 pm: **Reduced density matrix descriptions for electromagnetic induced transparency and related pump-probe optical phenomena in atomic systems** (*Invited Paper*), V. L. Jacobs, Z. Dutton, M. Bashkansky, M. J. Steiner, J. F. Reintjes, Naval Research Lab. [6482-35]

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