

Rensselaer Physics Department

Activities

January 2007 – March 2007

(Rensselaer Students are underlined)

HONORS AND AWARDS

H. NEWBERG

- Chair of the Scientific Organizing committee for SEGUE collaboration meeting, March 31-April 1, 2007.
- Chaired a session on “Other Surveys” at the SEGUE collaboration meeting in Philadelphia, PA, March 2007

INVITED TALKS

H. NEWBERG

- “Observations of the Milky Way from RPI to the Sloan Digital Sky Survey,” Albany Area Amateur Astronomers Meeting, Schenectady, NY, March 20, 2007
- “Sagittarius Debris, the Virgo Stellar Stream, and the new stream near the Galactic Plane,” SDSS Collaboration Meeting plenary session, Philadelphia, PA, March 30, 2007

X.-C ZHANG

- “THz technology and applications,” Short Course, SPIE Photonic West, Jan. 23, 2007.
- “Compact THz system,” Special Technology Area Review on Compact THz Sources. ONR/AFOSR, Arlington, VA Feb. 28, 2007.
- “Advanced THz technology,” Executive Meeting in 505 Group, Xianyang, China, March 19, 2007.

MEETING ATTENDANCE

H. NEWBERG

- American Astronomical Society meeting, January 6-10, 2007, Seattle, WA
- American Association of Physics Teachers workshop: A Primer on Astronomy Education Research, January 6, 2007, Seattle, WA
- SDSS II Collaboration Meeting, March 29 – 31, 2007, Philadelphia, PA
- SEGUE Meeting, March 31-April 1, 2007, Philadelphia, PA

OTHER PROFESSIONAL TRAVEL

X.-C ZHANG

- SPIE Photonics West – San Jose, CA; 1/21-1/23
- Meeting with HydroElectron Ventures (Matthew Price-Gallagher and Clark Fletcher) – Montreal, Quebec; 2/2
- HSARPA Project (Polychromatic Imaging for Standoff Detection of Explosives and Weapons) Review – Las Vegas, NV; 2/19-2/22
- STAR Review in Washington, DC and SC&A-HSARPA Review in Arlington, VA; 2/27-3/2
- ARO MURI Final Review – Mayaguez, Puerto Rico; 3/4-3/8

PRESENTATIONS (presenter in bold)

H. NEWBERG

- “The Nature of the Virgo Overdensity,” SDSS mini-meeting, January 6, 2007, Seattle, WA
“Improved Undergraduate Astronomy Laboratories with A Modern Telescope Control System,” Milano, Anthony J.; Broder, D.; Finn, R.; Newberg, H.; Weatherwax, A.; Whittet, D., American Astronomical Society Meeting, poster, January 6-10, 2007, Seattle, WA
- “Sagittarius Debris, the Virgo Stellar Stream, and the new stream near the Galactic Plane,” Newberg, Heidi J.; Yanny, B.; Cole, N.; Beers, T., American Astronomical Society Meeting, poster, January 6-10, 2007, Seattle, WA
- “The Most Metal-Poor Candidates in SDSS-I DR-5,” Beers, Timothy C.; Lee, Y.; Sivarani, T.; Marsteller, B.; Krugler, J.; Wilhelm, R.; Allende Prieto, C.; Norris, J.; Johnson, J.; Ivans, I.; and 5 coauthors, American Astronomical Society Meeting, poster, January 6-10, 2007, Seattle, WA

M. YAMAGUCHI

- **Masashi Yamaguchi**, and X.C.Zhang, *THz wave technology for suicide bomber detection*, DHS BomDetec Program March Review (March, 2007, Washington D.C.).
- **Masashi Yamaguchi**, *THz technology and THz center at RPI*, Meeting with CEOs from Benchmark Electronics and Quantum Wired requested by individual gift and gift planning office at RPI (Feb. 2007, RPI).
- **Masashi Yamaguchi**, and X.C.Zhang, *THz sensor for Suicide Bomber detection*, RPI-American Science & Engineering meeting for BomDetec Program (Jan. 2007, RPI)

X.-C ZHANG

- “Real Time Chemical Specific Explosive Detection” ARO-MURI final review, University of Puerto Rico, Mayaguez, Puerto Rico, March 7, 2007.

PAPERS PUBLISHED

T.-M. Lu

- “Experimental realization of a well-controlled 3D silicon spiral photonic crystal”, D.-X. Ye, Z.-P. Yang, A.S.P. Cang, J.Bur, S.Y. Lin, T.-M. Lu, R.Z. Wang, S. John, J. Phys. D: Appl. Phys. 40, 1 (2007).
- “Fan-like aggregations on seeds by parallel ballistic flux”, D.-X. Ye and T.-M. Lu, Phys. Rev. B75, 115420 (2007).
- “Onset of thermal degradation in poly(p-phenylene vinylene) films deposited by chemical vapor deposition”, Cynthia A. Gedelian, Gregory A. Ten Eyck, and Toh-Ming Lu, Synthetic Metals 157, 48 (2007).
- “Self-shadowing in ballistic fan formation from point seeds”, M. Pelliccione, and T.-M. Lu, submitted to Phys. Rev. B.
- “Wetting and electro-wetting properties of carbon nanotube templated Parylene films”, Zuankai Wang, Ya Ou, Toh-Ming Lu, and Nikhil Koratkar, submitted to The Journal of Physical Chemistry B.

H. NEWBERG

- “Sagittarius Debris, the Virgo Stellar Stream, the Asymmetric Spheroid, and yet more Tidal Debris in the Halo of the Milky Way,” Newberg, H. J., Yanny, B., Cole, N., Beers, T. C., Martinez-Delgado, D., Re Fiorentin, P., Schneider, D. P., and Wilhelm, R., Ap. J., submitted, 2007
- “An Orphan in the ‘Field of Streams’,” Belokurov, V.; Evans, N. W.; Irwin, M. J.; Lynden-Bell, D.; Yanny, B.; Vidrih, S.; Gilmore, G.; Seabroke, G.; Zucker, D. B.; Wilkinson, M. I.; and 12 coauthors, Ap. J., **658**, 337, 2007
- “Cats and Dogs, Hair and a Hero: A Quintet of New Milky Way Companions,” Belokurov, V.; Zucker, D. B.; Evans, N. W.; Kleyana, J. T.; Koposov, S.; Hodgkin, S. T.; Irwin, M. J.; Gilmore, G.; Wilkinson, M. I.; Fellhauer, M.; and 24 coauthors, Ap. J., **654**, 897, 2007

F. E. SCHUBERT

- J.-Q. XI, Martin F. Schubert, Jong Kyu Kim, E. Fred Schubert, Minfeng Chen, Shawn-Yu Lin, W. Liu and J. A. Smart “Optical thin-film materials with low refractive index for broadband elimination of Fresnel reflection”. Nature Photonics, Vol 1, March 2007

X.-C. ZHANG

- Hai-Bo Liu, George Plopper, Sarah Earley, Yunqing Chen, Bradley Ferguson, and X.-C. Zhang, “Sensing the change of biological cell monolayers by THz differential time-domain spectroscopy,” Biosensors and Bioelectronics, 22, p.1075-1080 (2007).

- Xu Xie, Jianming Dai, and X.-C. Zhang, “Enhancement of Terahertz wave generation from laser induced plasma,” Applied Physics Letters, in press (2007).
- Weining Wang, Haitao Yan, Weiwei Yue, Guozhong Zhao, Cunlin Zhang, Haibo Liu, and X.-C. Zhang, “THz spectrum of reduced glutathione,” Science in China, Ser. G. Physics, Mechanics & Astronomy, 48, 585-592 (2005).

PROPOSALS (SUBMITTED or GRANTED)

H. NEWBERG

- “REU Supplement: Revealing the Structure of the Galactic Halo through Statistical Analysis – Middle School Teacher Training,” March 2007, \$13,444, NSF
- “REU Supplement: SEI(AST): A Dynamic Grid for Astroinformatics: Data-Driven Discovery of the Milky Way Origin and Evolution from the Sloan Digital Sky Survey,” March 2007, Magdon-Ismail, Szymanski, Varela, and Newberg, March 2007, \$50,000, NSF

M. YAMAGUCHI

- “BomDetec-Wide Area Surveillance and Suicide bomber Detection at >10 m”, BAA Prototypes and Technology for Improvised Explosives Devices Detection, Department of Homeland Security, (Subcontract to Northeastern University, Benard M. Gordon Center for Subsurface Sensing and Imaging Systems, PI- X.C. Zhang, co-PI Masashi Yamaguchi, Jul. 2006-Apr. 2007, \$219,000, funded.
- “STTR: High-Power Time-domain THz Imaging System with Emitter and Detector Array”, PI- Hai-Bo Liu, co-PIs Masashi Yamaguchi, James Woo, Jiayin Ma, Mar.2007, Air force, \$100,000 for 1 year, submitted.
- “EXP-SA: Nanoscale THz spectroscopy for Improvised Explosive Devices (IEDs) Detection”, PI-Saroj Nayak, Yunqing Chen, and Masashi Yamaguchi, National Science Foundation, March 2007, \$80,000 for 1 year Submitted.

X.-C. ZHANG

- “BomDetec-Wide Area Surveillance and Suicide bomber Detection at >10 m”, BAA Prototypes and Technology for Improvised Explosives Devices Detection, Department of Homeland Security, (Subcontract to Northeastern University, Benard M. Gordon Center for Subsurface Sensing and Imaging Systems, PI- X.C. Zhang, co-PI Masashi Yamaguchi, Jul. 2006-Apr. 2007, \$219,000.
- Zomega THz Corp., \$50k gift, (2006). received.
- NSF, ECCS0716933, REU supplemental support “THz Wave Photonics,” \$6000. Awarded.
- “Rapid Standoff Detection for Explosives”, NSF EXP-SA, co-PI, J.M. Dai, \$400,000, submitted.

- “Terahertz Science and Engineering in Laser Induced Plasma” NSF/DOE, \$700,000, submitted.

SIGNIFICANT RESULTS OBTAINED OR NEW RESEARCH AFFILIATES

VISITORS TO RENSSELAER

H. NEWBERG

- Rob Knop, Vanderbilt University, February 17-20, 2007, begin collaboration on progenitors of Type Ia supernovae.
- Brian Yanny, Fermilab, February 3-7, 2007, continue collaboration on detection of substructure in the Galactic spheroid.
- Brian Connolly, Columbia University, January 25, 2007, give Astronomy Seminar

X.-C. ZHANG

- 1/5 – Yuting Wu, Graduate Student from the University of Illinois at Urbana Champaign
- 1/12 – James A. Roberts, Ph.D. – Hamamatsu Corporation
- 1/16 – Professor Gun-Sik Park – Seoul National University, Seoul, Korea
- 1/25 – Shintaro Kasai – Terahertz Research Department, Canon, Inc. (Japan)
- 1/31 – Professor See Leang Chin – Universite Laval, Quebec City, Quebec
- 2/6 – Dr. Nobuaki Kawahara, General Manager, Research Laboratories, DENSO CORPORATION (DENSO JAPAN); Dr. Yoshiyasu Yamada, Research Manager, DENSO International America
- 2/7 – Joseph Knab – University at Buffalo (PostDoctoral Research candidate)
- 3/23 – Professor Choon-Sae Lee – Southern Methodist University, Dallas, TX
- 3/27 – Harold Haugen, Professor and Henry Tiedje, Research Engineer – McMaster University, Hamilton, Ontario
- 3/28 – Jeff Johnston, Senior Program Officer – Keck Foundation
- 3/30 – Erik Lucas (DHS); Donald Bansleben (DHS); Steve Ostrow (SC&A) and Rich Skibo (PNTS) – HSARPA LVPCDS Project – Final Site Review Meeting

NON-PROFESSIONAL ACTIVITIES

IMPORTANT ACTIVITIES OF STUDENTS

H. NEWBERG

- Nate Cole gave a talk entitled “Maximum Likelihood fits to the Sagittarius Stream” on April 1, 2007 at the SEGUE meeting, Philadelphia, PA
- Ben Willett gave a talk entitled “N-body simulations of dwarfs” on April 1, 2007 at the SEGUE meeting, Philadelphia, PA

OTHER

H. NEWBERG

- Finished NSF-funded refurbishment of the Hirsch Observatory’s 16” B&C telescope. Open house run by the Rensselaer Astrophysical Society February 16-24, 2007. One hundred people attended the public open house, and an additional 50 people attended the campus-only nights, even though the weather was very cold. These activities were advertised in the Polytechnic and in the Times Union. Undergraduate Anthony Milano was interviewed on camera for a TV news program announcing the open house.