



# The Center for Optical Materials Science and Engineering Technologies (COMSET)

## Year 6 State of the Center Report

On **Wednesday, April 12, 2006**, COMSET celebrates its sixth birthday!! Kindly find below an update on activities and notable accomplishments over the past five years.

### Year Six Summary of Achievements:

- o COMSET was awarded over \$7,200,000 in sponsored research over the past fiscal year. To date, sponsored programs activity totals \$31,359,999 in awards with \$4,134,539 still pending in outstanding proposals. This also does not include an \$894,100 equipment gift by the 3M Corporation of a production MCVD lathe and considerable additional complementary glass processing and fiber characterization equipment. This gift, along with our existing optical fiber draw tower, position COMSET as the academic leader in optical fiber materials research in the United States.
- o COMSET's hit rate on proposals is 64 awards / 108 proposals = 59% (not including those still pending). This ~ hit-rate is absolutely stunning and, I suspect, the highest by any unit at Clemson.
- o Two COMSET-affiliated faculty (Dr. Jian Luo, Materials Science and Engineering and Dr. Jason McNeill, Chemistry) were recipients of the NSF CAREER award which "offers the National Science Foundation's most prestigious awards for outstanding faculty early in their independent professional careers."
- o Update on COMSET start-up companies: Advanced Photonic Crystals (Fort Mill, SC) and Tetramer Technologies (Pendleton, SC) have maintained their extraordinary success, particularly in sponsored research through Federal *Small Business Innovation Research* (SBIR) awards. To date, these two companies have won 12 SBIR awards out of 14 proposals. This 86% success rate is over 6 times the national average (~ 12 - 15 %). Further, there are approximately 14 employees earning over 220% of the South Carolina per capita average, which is a critical step forward in reducing the State's income differential with respect to the national average.
- o Carolina MicroOptics Triangle (CMOT) Update: Our photonics research and economic development partnership between Clemson, UNC-Charlotte and Western Carolina University was nationally launched this year with very well received exhibits at the *SPIE Photonics West* and the *OSA Optical Fiber Communications* conferences. CMOT also has formalized a unique Industry Affiliates program across the three Universities and is to roll out this year a Venture Program to facilitate the creation of more start up companies.
- o Clemson/Furman Partnership: On October 3, 2005, Clemson and Furman entered into a formal partnership establishing a laser innovation center dedicated to Dr. Charles H. Townes. Dr.

Townes is an alumnus of Furman (1935), honorary degree recipient from Clemson (1963) and Nobel Laureate (Physics, 1964) for the invention of the maser/laser. The partnership's initiatives will focus on:

- fostering joint research between Clemson and Furman scholars in optics, lasers, and photonics.
  - developing joint coursework for Clemson and Furman undergraduates in the optical and laser sciences.
  - implementing a research fellowship program for Furman undergraduates at the Clemson University optics and laser laboratories.
- o Sirrine Foundation Gift: Thanks for the efforts of Drs. Joe Kolis and Kathleen Richardson the Sirrine Foundation gifted \$2,800,000 towards COMSET's *Research Center of Economic Excellence in Optical Materials Endowed Chair*. These funds were matched dollar-for-dollar with State funds such that the \$5,600,000 total is the largest single endowment in the country in any area of optics. The Chair will be resident in the *School of Materials Science and Engineering* and will be topically focused in optical fibers. It is anticipated that an official announcement naming the Chair will occur in the Fall 2006.
  - o Dr. Roger Stolen joined COMSET through an adjunct professorship in the School of Materials Science and Engineering. Dr. Stolen was part of the team at Bell Labs that, in 1980 first observed solitons in optical fibers and then, in 1983, created the soliton laser, which generates ultra-short pulses that travel great distances without dispersion. In 1990, Dr. Stolen received the R. W. Wood prize from the Optical Society of America which recognizes outstanding discovery, scientific or technical achievement, or invention in the field of optics. In 2005, Dr. Stolen received the John Tyndall Award, which recognizes an individual who has made pioneering, highly significant, or continuing technical or leadership contributions to fiber optics technology.
  - o Dr. Sergei Pyshkin is visiting Clemson during the 2005-2006 Academic Year as a prestigious *Fulbright Scholar*. Prof. Dr. Pyshkin is a professor and principal investigator at the Academy of Sciences of Moldova. The Fulbright program, America's flagship international educational exchange activity, is sponsored by the U.S. Department of State and the Bureau of Education and Cultural Affairs.
  - o As one way of enhancing Clemson's visibility, COMSET faculty participated in the organization of numerous national and international conferences including:
    - Dr. Dennis Smith: *Organic Thin Films for Photonics* (OSA/ACS), *Fluorine Containing Polymers* (ACS), *Fluoropolymer 2006* (ACS).
    - Dr. John Ballato: *Micromachining Technology for Micro-Optics and Nano-Optics IV* (SPIE), *Optically Active Materials* (ACerS), *Nanophotonics / Integrated Photonics Research and Their Application* (OSA), *Optical Science and Materials* (OSA/SPIE).
    - Dr. Kathleen Richardson: Chair, *Glass and Optical Materials Division* (GOMD) of the American Ceramic Society; Secretary/Treasurer, *National Institute of Ceramic Engineers* (NICE).

- o New COMSET website launched: Through considerable efforts by Prof. Foulger, COMSET launched a new website; see: <http://comset.clemson.edu>
- o *Faculty Awards/Recognition*: COMSET affiliated faculty have been honored with numerous national and international awards and recognitions. These include:
  - Dr. Joe Kolis: named Interim Director of the Clemson University Research Foundation.
  - Dr. Dennis Smith: elected to Sigma Xi.
  - Dr. Steve Foulger: Optics.org and Laser Focus World highlighted his recent papers that were published in *Advanced Materials*, which is the premiere international journal for scholarship in advanced materials.
  - Dr. John Ballato: selected as a *Liberty Fellow*; The Liberty Fellowship is a statewide leadership program aimed at identifying the future leaders of South Carolina and gives them special executive management and leadership training (Ballato Mentor: The Honorable David Wilkins; US Ambassador to Canada).
  - Dr. Kathleen Richardson: appointed to the *Presidential Task Force* defining strategic directions for The College of Engineering, Alfred University.
  - Dr. Kathleen Richardson: Student, Clara Rivera, was awarded the *Kreidl Award* by the American Ceramic Society for outstanding glass research on *High Raman Gain Glasses*.

#### **FACULTY**

- Alphabetically Sorted active faculty during FY05 (home academic department noted):
  - i. Dr. John Ballato (Materials Science and Engineering)
  - ii. Dr. Philip Brown (Materials Science and Engineering)
  - iii. Dr. George Chumanov (Chemistry)
  - iv. Dr. Stephen Foulger (Materials Science and Engineering)
  - v. Dr. Joseph Kolis (Chemistry)
  - vi. Dr. Jian Luo (Materials Science and Engineering)
  - vii. Dr. Igor Luzinov (Materials Science and Engineering)
  - viii. Dr. Dennis Smith (Chemistry)
  - ix. Dr. Caron St. John (Spiro Center for Entrepreneurial Leadership)
- Adjuncts/Visiting Scholars
  - i. Dr. Jeff DiMaio (Materials Science and Engineering)
  - ii. Dr. Laeticia Petit (Materials Science and Engineering)
  - iii. Dr. Roger Stolen (Materials Science and Engineering)
  - iv. Dr. Chris Topping (Chemistry)