

**Center for Optoelectronics and Optical Communications
Publications, Patents and Grants
2006 –2007**

Books and Book Chapters

Nanostructured Materials, Ed. Carl C Koch, (Noyes Publication, Norwich, NY, 2002, prepared 2nd edition) Chapter: Nanostructured Electronics and Optoelectronic Materials, R. Tsu and Q. Zhang, pp 527-567.

Journals and Conference Publications

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M.A. Anastasio, D. Shi and G. Gbur, "Multispectral Intensity Diffraction Tomography Reconstruction Theory: Quasi-nondispersive Objects", *Journal of Optical Society of America, A* 23, 1359, (2006).

A. Andreu, J.W. Merkert, L.A. Lecaros, B.L. Broglin, J.T. Brazell and M. El-Kouedi, "Detection of DNA Oligonucleotides on Nanowire Array Electrodes Using Chronocoulometry", *Sensors and Actuators, B: Chemical*, B114, 2, 1116-1120, (2006).

S.P. Ashili, V.N. Astratov and E.C.H. Sykes, "The Effects of Inter-Cavity Separation on Optical Coupling in Dielectric Bispheres", *Optics Express*, 14, 9460-9466, (2006).

V.N. Astratov, S.P. Ashili and A.M. Kapitonov, "Optical Properties of Mesoscopic Systems of Coupled Microspheres", *Proceedings of Progress in Electromagnetics Research Symposium, Beijing, China, March 2007; PIERS Online*, 3, 278-280, (2007).

V.N. Astratov, S. Yang, S. Lam, D. Sanvitto, A. Tahraoui, D.M. Whittaker, A.M. Fox and M.S. Skolnick, "Observation of Whispering Gallery Resonances in Circular and Elliptical Semiconductor Pillar Microcavities", *Proceedings of Progress in Electromagnetics Research Symposium, Beijing, China, March 2007; PIERS Online*, 3, 311-314, (2007).

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Conference Presentations

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- K. N. Patel, E.B. Stokes, C.C. Burkhart and P. Barletta, "Electrical Characterization of Novel GaN Light Emitting Diodes with II-VI Quantum Dot Layer", 210th Electrochemical Society Meeting, Cancun, Mexico, Oct. 31, 2006.
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- M. U. Wasim, S. M. H. Zaidi, M. Y. A. Raja, N. Ghani, and R. Ahmad, "Survivable Passive Access Network (SPAN)", Proc Globecom-NGN, 2006.

M. U. Wasim, S. M. H. Zaidi, M. Y. A. Raja, N. Ghani, and R. Ahmad, "Wavelength Division Multiplexing Based Passive Optical Networks: An Overview", Proc Globecom-NGN 2006.

U. Younis, R. Muzaffar, S. M. H. Zaidi, and M. Y. A. Raja, "Dynamic Bandwidth Allocation Algorithm using Sequential Channel Selection for Hybrid WDM/TDM EPON" Proc, ICCCN 2006.

H. Zhang, M. Tang, J. McCoy, and T.H. Her, "Growth of Periodic Tungsten Nanoripples Induced by Linearly Polarized Femtosecond laser," CLEO 06.

Grants (last two years)

KENNETH GONSALVE Chemistry
NC Biotechnology Ctr \$1,500
Nanoscale Science and Engineering Conference

KENNETH GONSALVES Chemistry
DOD/Army \$5,000
Nanoscale Science and Engineering Conference at UNCC-partial support

KENNETH GONSALVES Chemistry
Rohm & Haas \$71,050
Prototype Resists for 193 nm and EUVL

KENNETH GONSALVES Chemistry
Intel Corp \$109,662
Kinetics & Diffusion Studies in Polymer-bound PAG Resists for EUVL

KENNETH GONSALVES Chemistry
MICHAEL HUDSON Biology
Carolinas Healthcare System \$27,000
Utilizing Nanospheres to Transport Antibiotics

KENNETH GONSALVES Chemistry
Rohm & Haas \$78,650
Prototype Resists for Nanolithography

THOMAS SCHMEDAKE Chemistry
EDWARD STOKES Electrical & Computer Engineering
Dot Metrics Technologies \$24,200
SBIR: Colloidal Quantum Dot Emitters for Deep UV LEDs

THOMAS SCHMEDAKE Chemistry
American Chemical Society/Petroleum Research Fund \$35,000
Synthesis and Photochemical Characterization of Hexacoordinate

THOMAS SCHMEDAKE Chemistry
Research Corp \$35,300
Development of Nanoscale Optical Materials

WEI CAI Mathematics and Statistics
VASILY ASTRATOV Physics and Optical Science
NSF \$180,000
High Order Numerical Methods for Light Propagation in Micro-Photonics

WEI CAI Mathematics and Statistics
Dept of Energy \$183,317
Algorithms for Nonlinear Maxwell Equations in Nonhomogeneous Media and Photonic
Resonant Waveguides with Coupled Microspheres

MICHAEL KLIBANOV Mathematics and Statistics
DOD/Army/Army Research Office \$45,000
Globally Convergent Numerical Methods for Coefficient Inverse Problems

MICHAEL KLIBANOV Mathematics and Statistics
DOD/Army/Army Research Office \$95,306
Globally Convergent Numerical Methods for Coefficient Inverse Problems

MICHAEL KLIBANOV Mathematics and Statistics
DOD/Army/Army Research Office \$98,873
Globally Convergent Numerical Methods for Coefficient Inverse Problems

MICHAEL KLIBANOV Mathematics and Statistics
University of Texas at Arlington \$16,716
Computational Optical Tomography for Anti-stroke Therapy

VASILY ASTRATOV Physics and Optical Science
UNCC Faculty Research Grant \$6,000
Fundamentals and Applications of Coupled Cavities with Whispering Gallery Modes

VASILY ASTRATOV Physics and Optical Science
WEI CAI Mathematics and Statistics
MOHAMMED-ALI HASAN Electrical & Computer Engineering
DOD/Army/Army Research Office \$85,000
Optical Circuits Based on Coupling between Whispering Gallery Modes in Dielectric
Microresonators

VASILY ASTRATOV Physics and Optical Science
WEI CAI Mathematics and Statistics
MOHAMMED-ALI HASAN Electrical & Computer Engineering
DOD/Army/Army Research Office \$65,000
Optical Circuits Based on Coupling between Whispering Gallery Modes in Dielectric
Microresonators

ANGELA DAVIES Physics and Optical Science
NSF \$28,000
IREE: Advancing Metrology for Micro-Optics Manufacturing Through an International
Collaboration with the Vrije Universiteit Brussels. A CAREER supplement.

FARAMARZ FARAHI Physics and Optical Science
Fizeau Electro-Optic Systems \$10,000
Optical Waveguide Device for Frequency Stabilized Laser Diodes

MICHAEL FIDDY Physics and Optical Science
MICHAEL FIDDY Electrical & Computer Engineering
DOD/Army/Army Research Office \$4,450,000
Advanced Integrated Technologies: a collaborative agreement with ARL for research into
sources and sensors

MICHAEL FIDDY Physics and Optical Science
TOM SULESKI Physics and Optical Science
Duke University \$104,425
Compressive Optical MONTAGE Photography Initiative

MICHAEL FIDDY Physics and Optical Science
MICHAEL FIDDY Electrical & Computer Engineering
UNC Office of the President \$5,500
North Carolina Photonics Initiative Phase II

MICHAEL FIDDY Physics and Optical Science
MICHAEL FIDDY Electrical & Computer Engineering
UNC Office of the President \$68,000
North Carolina Photonics Initiative Phase II

MICHAEL FIDDY Physics and Optical Science
MICHAEL FIDDY Electrical & Computer Engineering
UNC Office of the President \$25,000
North Carolina Photonics Initiative Phase II

MICHAEL FIDDY Physics and Optical Science
TOM SULESKI Physics and Optical Science
Duke University \$95,575
Compressive Optical MONTAGE Photography Initiative

MICHAEL FIDDY Physics and Optical Science
MICHAEL FIDDY Electrical & Computer Engineering
UNC Office of the President \$6,200
North Carolina Photonics Initiative Phase II

MICHAEL FIDDY Electrical & Computer Engineering
MICHAEL FIDDY Physics and Optical Science
Oak Ridge Associated Universities \$600
Oak Ridge Visiting Industry Grant

MICHAEL FIDDY Physics and Optical Science
MICHAEL FIDDY Electrical & Computer Engineering
Department of Energy \$240,667
UNC Chapel Hill/ UNC Charlotte University Collaborative Initiative in Biomedical
Imaging to Study Complex Diseases

NATHANIEL FRIED Physics and Optical Science
UNC Charlotte Faculty Research Grant \$6,000
Novel Optical Imaging System for Identification of Prostrate Nerves Responsible for
Erectile Function

NATHANIEL FRIED Physics and Optical Science
National Institute of Health Phase II SBIR \$250,000
Oxide Glass Fiber Optimized for Short Pulse IR Lasers

GREGORY GBUR Physics and Optical Science
DOD/Air Force/Office of Scientific Research \$35,232
Developing 'superbeams' for improved propagation through turbulence

GREGORY GBUR Physics and Optical Science
DOD/Air Force/Office of Scientific Research \$35,953
Developing 'Superbeams' for Improved Propagation through Turbulence

GREGORY GBUR Physics and Optical Science
Dept of Energy \$54,000
A Study of Plasmonic Enhanced Transmission Effects in Nano-optics

GREGORY GBUR Physics and Optical Science
DOD/Air Force/Office of Scientific Research \$37,398
Developing 'superbeams' for improved propagation through turbulence

TSING-HUA HER Physics and Optical Science
NSF \$105,462
Femtosecond-laser-induced Self-assembly of Nanograting on Nanowires: An Enabling
Technique for Nanowire-based Active Nanophotonics

M YASIN RAJA Physics and Optical Science
NSF \$34,980
High-capacity Optical Networking Symposium (HONET 2006)

TOM SULESKI Physics and Optical Science
University of California at Los Angeles \$30,000
Compact Scatterometer for Integrated Process Control on the UMIL System

THOMAS SULESKI Physics and Optical Science
UNC Charlotte Junior Faculty Research Grant \$6,000
Three-dimensional Photonic Metamaterials

ROBERT TYSON Physics and Optical Science
UNC General Administration \$1,500
Professional Science Master's Degree Planning Grant: Medical Physics

ROBERT TYSON Physics and Optical Science
Block MEMS LLC \$34,999
Image Sharpness Sensor Modeling, Experiment, and Integration Support

ROBERT TYSON Physics and Optical Science
L3Com-Brashear \$55,720

EDWARD STOKES Electrical & Computer Engineering
RF Micro Devices \$363,517
Metal organic chemical vapor deposition (MOCVD) reactor donation

EDWARD STOKES Electrical & Computer Engineering
MOHAMMED-ALI HASAN Electrical & Computer Engineering
Dot Metrics Technologies \$120,905
Phase 2 SBIR: Nanostructured active layers for deep-green light emitting diodes (LEDs)

EDWARD STOKES Electrical & Computer Engineering
THOMAS SCHMEDAKE Chemistry
DARPA \$177,905
SBIR Phase 2: Nanostructured Active Layers for Deep Green Light Emitting Diodes

RAPHAEL TSU Electrical & Computer Engineering
KASRA DANESHVAR Electrical & Computer Engineering
MOHAMMED-ALI HASAN Electrical & Computer Engineering
JOHN HUDAK Electrical & Computer Engineering
Northrop Grumman Corp \$1,371,150
Superlattice - Phase III UNC Charlotte Support

ROBERT WILHELM Mechanical Engineering & Engineering Science
MICHAEL FIDDY Physics and Optical Science
MICHAEL FIDDY Electrical & Computer Engineering
Dept of Commerce/ Economic Development Administration \$1,270,000
UNC Charlotte/Charlotte Research Institute Applied Optics Regional Economic Support
Project

Patents/Inventions

PATENTS

“High Resolution Resist for Next Generation Lithographies” US patent: 7,008,749 B2
2006

BOBBIO, S

“Nanocomposite Negative Resist for NGL” US patent 7049044 2006.

BOBBIO, S. and Hasan, M. A.

“Structural Extending Member II”; Stephen Bobbio; filed January 3, 2007.

PATENT APPLICATIONS

(5 applications filed)

Application #60/849,388, "Design and methods of manufacturing hard, soft and hybrid
contact lenses"

FARAH, Faramarz (#UNCC IR 2006-040)

Application #60/858,382, "Partially and fully automated disinfecting systems"

FARAH, Faramarz (#UNCC IR 2006-043)

Application #11/544,463, "Synthesis and Characterization of Novel Anionic PAG
Containing Resists for 193 nm & EUV Lithography Photoacid Generators &
Lithographic Resists Comprising the Same"

GONSALVES, Kenneth E., WANG, Mingxing, (#UNCC IR 2006-002)

Application #60/841,913, "Sensing applications for dye-filled mesoporous, colloidal
material"

SCHMEDAKE, Thomas A, JAKOB, Adam M, HUDGINS, Robert (#UNCC IR 2006-
037)

Application #60/875,601, "Discrete Electron Transistor"

TSU, Raphael, LAFAVE, Tim (#UNCC IR 2006-051)