Biographical Sketch

Niloy K. Dutta

Niloy K. Dutta received his MS and PhD in Physics from Cornell University in 1976 and 1978 respectively. He received his BSc (Honours) and MSc in Physics from St. Stephen's College, New Delhi in 1972 and 1974 respectively. Since 1997 he has been a Professor of Physics at the University of Connecticut. Prior to that from 1990 to 1997 he was Head of Optoelectronic Device Research Department at Bell Laboratories at Murray Hill, NJ.

In 1976 he conducted the first experiments on intracavity absorption spectroscopy using a tunable infrared laser. In 1978 he reported the first observation of resonant photoexcited charge transfer.

He joined Bell Laboratories in 1979 where he has made numerous contributions to the research and development of semiconductor lasers for lightwave transmission systems. His many significant research accomplishments include explanation of the high temperature performance of long wavelength semiconductor lasers, first InGaAsP quantum well laser, first tunable Bragg reflector laser, first 10 Gb/s lightwave transmission field experiment, first coherent transmission field experiment, and two dimensional optical interconnection systems.

He joined the University of Connecticut in 1997 as Professor of Physics. His current research programs include high speed optical transmission, optical networks, photonic logic devices and circuits, fiber lasers and optical coherence tomography.

He has published over 350 papers and 20 review chapters on semiconductor lasers, optical amplifiers, coherent transmission systems, optoelectronic integration, device physics and lightwave telecommunication system experiments. He has co-authored books on "Long Wavelength Semiconductor Lasers "(1986), "Semiconductor Lasers" (1992), and, "Semiconductor Optical Amplifiers" (2006). He has edited and authored chapters in: " Vertical Cavity Surface Emitting Lasers" (2000), " WDM Technologies – Active Optical Components" (2003),"WDM Technologies – Passive Optical Components" (2004)and, "WDM Technologies – Optical Networks" (2005).

He is a Fellow of the Institute of Electrical Engineers (IEEE), the Optical Society of America and the International Society of Optical Engineers (SPIE). He received the LEOS Distinguished Lecturer Award in 1995. He is a Member of Connecticut Academy of Science and Engineering.

CURRICULUM VITAE

Niloy K. Dutta

Business Address:

Department of Physics
University of Connecticut
2152 Hillside Road, U-3046
Storrs, CT, 06269-3046
VOICE - (860) 486-3481, 0610(lab)
FAX - (860) 486-3346
E-mail: nkd@phys.uconn.edu Citizenship: US

EDUCATION :

St. Stephen's College, New Delhi, BSc Physics 1972
St. Stephen's College, New Delhi, MSc Physics 1974
Cornell University, Ithaca, N.Y, MS Physics 1976
Cornell University, Ithaca, N.Y, PhD Physics 1978

INDUSTRIAL AND ACADEMIC EXPERIENCES:

1997- Professor of Physics , University of Connecticut, Storrs, CT 06269
Associate Director, Photonics Research Center (1997-2003)
Co-Chair Engineering Physics Program, (2001-)
Current research programs include high speed optical transmission, optical networks, optical logic devices, fiber lasers and optical coherence tomography

1990 - 1997 AT&T Bell Laboratories, Murray Hill, New Jersey (**Retired**)
Head, Optoelectronic Device Research Department
Research on optical interconnection circuits and systems technology for computing and ATM switching systems applications. Research on analog and digital fiber optic telecommunication systems using WDM technology. Research on surface emitting lasers, photoreceiver circuits, optical modulators and high power lasers.

1989 - 1990 AT&T Bell Laboratories, Murray Hill, New Jersey
Head, Optical Materials Research Department
Research on synthesis and characterization of III-V and II-VI compound semiconductors, bulk crystal growth, strained layers and dielectrics.

1986 - 1989 AT&T Bell Laboratories, Murray Hill, New Jersey
Supervisor, Laser Design and Fabrication Group
Development of distributed feedback laser technology, transfer of that technology to manufacturing and fabrication of novel photonic devices.
Taught courses in "Lightwave Source and Detector Technology " for MS program for Bell Labs employees in 1985, 86 and 88

1979 - 1985 AT&T Bell Laboratories, Murray Hill, New Jersey
Member of Technical Staff in Laser Development Group
Design and fabrication of AlGaAs and InGaAsP semiconductor lasers for fiber communication system applications. Concentrated on laser

device physics, laser structure design, and characterization from 1979 to 1983 and on growth and processing from 1984 to 1985

1978 - 1979 Cornell University, Ithaca, N. Y.
Research Asssociate, Laboratory of Atomic and Solid State Physics
Conducted research on new laser transitions in the vacuum ultraviolet region using charge transfer collisions between rare gas ions and alkali atoms. Developed the theory of nonlinear optics for nonmonochromatic light.

1975 - 1977 Cornell University, Ithaca, N. Y.
Research Assistant, Laboratory of Atomic and Solid State Physics
Constructed and operated a Spin- Flip Raman Laser Facility for Cornell`s Materials Science Center. The tunable laser was used for spectroscopic investigation of several molecules. The techniques of intracavity and optoacoustic spectroscopy was developed. This work was part of the PhD thesis - A Study of Stimulated Infrared Scattering With Applications to Infrared Spectroscopy.

SIGNIFICANT CONTRIBUTIONS:

1978 : First observation of resonant photoexcited charge transfer

1980 : Experimental and theoretical work on radiative and nonradiative recombination
- 81 mechanisms in semiconductors which led to the first identification of high temperature threshold problem of InGaAsP lasers and improved understanding of sublinearity of LEDs.

1982 : First demonstration of InGaAsP laser operation to > 100 C

1983 : Investigation of optical reflections on the performance of single wavelength lasers for lightwave system applications.

1984 : First InGaAsP quantum well laser.

1985 : First InGaAsP high power laser array

1986 : First InGaAsP tunable distributed feedback and Bragg reflector laser.

1988 : Fabrication of ultra linear lasers and first application in CATV analog transmission systems

1989 : First demonstration of lightwave transmission of a Tera-Bit-Km system

1989 : First successful coherent system field trial
First tunable sub MHz linewidth DFB laser for coherent transmission

1990 : Investigation of strained layer quantum well lasers. First sub mA threshold InGaAsP laser
-91 First demonstration of a laser using monolayer thick superlattice structure

1992 : Fabrication of integrated optoelectronic circuit arrays and their implementation in
-93 optical interconnection system experiment

1994 : Fabrication of optical array devices and circuits and their application in large computing systems,

-95 ATM Switching systems, and multimedia transmission systems

1996 : Fabrication of high speed lasers, Subcarrier multiplexed transmission, Wavelength conversion for
-97 optical networks, WDM transmission

1998 : Demonstration of 100 Gb/s time division multiplexed transmission, Optical transmission using
-99 plastic fibers

2000 : Demonstration of stable sub ps pulses from a fiber laser, High power Nd doped fiber laser
-01 Demonstrated applications of optical coherence tomography for dental tissue imaging

2002 : Developed new techniques for optical clock recovery for high speed transmission, Demonstrated
- 03 femto-second pulse generation using high order solitons from fiber lasers, Demonstrated optical add/drop at 100 Gb/s

2004 : Demonstration and study of photonic logic operations at high speed using semiconductor optical
- 06 amplifier based Mach-Zehnder interferometer devices

2007 : Demonstration and study of optical correlators using semiconductor optical amplifier based circuits
- 09 and fiber lasers

2010 : Supercontinuum generation in nonlinear fibers and study of two-photon absorption in optical
-11 amplifiers

PUBLICATIONS:

More than 350 publications, 20 review articles, 7 books - co-authored and edited

PROFESSIONAL SOCIETY HONORS AND AWARD:

Institute of Electrical and Electronic Engineers (IEEE), Fellow, 1990 -
Optical Society of America (OSA), Fellow, 1986 -
International Society of Optical Engineers (SPIE), Fellow, 1993 -
Lasers and Electro-Optics Society (LEOS) Distinguished Lecturer Award: "Optical Interconnection Technology for Large Computing and Switching Systems" - 1995
Lucent President's Award - 1998
Member, Connecticut Academy of Science and Engineering , 1998-
Spotlight Award from Government Communications for "Inverse Multiplexing" - 2000
Airborne Fiber Optic Amplifier Award - 2002

PROFESSIONAL ACTIVITIES:

Chair, Semiconductor Laser Workshop, 1982
Chair, High Speed Optoelectronics Conference, 1992
Co-Chair, Conference on Active and Passive Components for WDM Communication, 2001
Co-Chair, Conference on Testing and Reliability of Optoelectronic Devices, 2002
Co-Chair, ITCOM - Information Technologies and Communication Conference, 2002 - 2007
Subcommittee Chair and Program Committee member of LEOS meetings, OSA meetings, SPIE meetings, and CLEO meetings
Associate Editor: IEEE Journal of Quantum Electronics 1997- 2002
Group Chair, Optoelectronics Group, Optical Society of America, 1999-2001
Division Chair, Photonics Division, Optical Society of America, 2001- 2004

Co-Chair, Semiconductor Optical Amplifier Workshop, Optical Fiber Communication, 2006
Associate Editor: IEEE Photonics Technology Letters, 2009-

TEACHING:

Developed the Engineering Physics Program at the University of Connecticut which is jointly offered by the Physics Department and School of Engineering – Serves as the Co-Chair of this program (2001 -)

Introduced two new graduate level courses in Physics Department

- Semiconductor Optical Devices
- Semiconductor Physics

These courses are taken by both Physics and Electrical Engineering students.

PhD. GRADUATE STUDENTS:

Dr. H. Fan (1999), Dr. C. Wu (2000), Dr. M. Tayahi (2001) , Dr. N. Choudhuri (2000), Dr. K. Lu (2001), Dr. M. El-Aasser (2002), Dr. H. Chen (2002), Dr. D. Piao (2003), Dr. G. Zhu (2004), Dr. P. Dua (2004), Dr. Q. Wang (2005), Dr. H. Dong (2006), Dr. H. Sun (2008) , Dr. Z. Chen (2010) , Dr. A. Kotb (2011)

S. Ma, W. Li, H. Hu

LIST OF REVIEW ARTICLES AND BOOKS:

BOOKS:

1. Long Wavelength Semiconductor Lasers, G. P. Agrawal and N. K. Dutta, van Nostrand Reinhold Co. N. Y. 1986

2. Semiconductor Lasers, G. P. Agrawal and N. K. Dutta, van Nostrand Reinhold C.o. N.Y. 1993

3. Vertical Cavity Surface Emitting Laser Technology, Ed. by J. Cheng and N. K. Dutta, Gordon and Breach Pub, Co. 1999

4. WDM Technologies: Active Optical Components, Ed. by A. K. Dutta, N. K. Dutta and M. Fujiwara, Academic Press, NY, June 2002

5. WDM Technologies: Passive Optical Components, Ed. by A. K. Dutta, N. K. Dutta and M. Fujiwara, Academic Press, NY, May 2003

6. WDM Technologies: Optical Networks, Ed. by A. K. Dutta, N. K. Dutta and M. Fujiwara, Academic Press, NY, October 2004

7. Semiconductor Optical Amplifier, World Scientific, Singapore, April, 2006, N. K. Dutta and Q. Wang

REVIEW ARTICLES:

1. R. J. Nelson and N. K. Dutta " Review of InGaAsP-InP laser structures and comparison of their performance " Semiconductor and Semimetal vol. 22, part C, R. K. Willardson and A. C. Beer (Ed) W. T. Tsang (vol. Ed) Academic Press N. Y. 1985

2. N. K. Dutta " Optical Sources for Lightwave System Applications " Fiber Optics Technology ed. E. E. Basch , Howard Sams Co. 1986

3. N. K. Dutta " Physics of Quantum Well Lasers " in Heterojunctions: A Modern View of Band Discontinuities and Device Applications ed. F. Capasso and G. Margaritondo , North Holland Co, 1987

4. N. K. Dutta and C. L. Zipfel " Reliability of Lasers and LEDs " Optical Fiber Communications II ed S. Miller and I. P. Kaminow, Academic Press N.Y. 1988

5. N. K. Dutta " Basic Physics of Semiconductor Lasers " Optoelectronic Technology and Lightwave Communication Systems ed C. Lin, van Nostrand Reinhold Co. N.Y. 1989

6. N. K. Dutta and J. R. Simpson " Optical Amplifiers " Progress in Optics book series ed E. Wolf, North Holland, Amsterdam, 1992

7. N. K. Dutta " InGaAsP Quantum Well Lasers " InP and Related Materials - Processing, Technology and Devices " ed A. Katz, Artech House, N.Y 1991

8. N. K. Dutta " Radiative Transitions in GaAs and other III-V Compounds " Semiconductor and Semimetals ed by Willardson and Beer, Academic Press, N.Y. 1993

9. P. K. Bhattacharya and N. K. Dutta " Quantum Well Optical Devices and Materials " Annual Review of Materials Science vol. 23, Annual Reviews Inc., Palo Alto, CA, 1993

10. N. K. Dutta " InGaAs DH and Quantum Well Lasers " Properties of Lattice Matched and Strained InGaAs, IEE press, England ,1993

11. N. K. Dutta " Semiconductor Lasers and Optical Amplifiers " in " Fiber Optic Communications" World Scientific., N.Y. 1995

12. N. K. Dutta " Optical Sources " in " Communications Handbook " CRC Press, 1996

13. N. K. Dutta " Lattice matched GaAs and InP -based QW lasers " in " Properties of III-V superlattices and quantum wells " Institute of Electrical Engineers, UK

14. N. K. Dutta, B. F. Levine, D. Vakhshoori, K.Y. Tu " Optical data links and parallel optical interconnects " in " Optical Interconnection Technology " Gordon and Breach Pub. NY

15. N. K. Dutta " Lasers, amplifiers and modulators based on InP based materials " in " InP based materials and devices : Physics and Technology " edited by O. Wada and H. Hasegawa, John Wiley and Sons. 1999

16. N. K. Dutta " Long Wavelength Laser Source" in WDM Technologies: Active Optical Components, Academic Press, NY, 2002 , Ed. By A. K. Dutta, N. K. Dutta and M. Fujiwara

17. N. K. Dutta " Semiconductor Optical Amplifiers" in WDM Technologies: Passive Optical Components, Academic Press, NY, 2002 , Ed. By A. K. Dutta, N. K. Dutta and M. Fujiwara

18. N. K. Dutta and N. Choudhuri" Optical Sources For Telecommunication" Chapter 46, pp 46-1 to 46-30, in " Communications Handbook " CRC Press, 2002

19. N. K. Dutta and K. Lu " Optical Modulators" in Encyclopedia of Optical Engineering, pp1752-1762, Marcel Dekker Inc. , 2003

20. N. K. Dutta " Basic Principles of Laser Diodes " in "Handbook of Laser Technology and Applications", pp 525-560, ed. C. Webb and J. Jones, Institute of Physics, 2004

21. P. Dua, K. Lu, N. K. Dutta and J. Jaques "Analog and digital transmission using high-power fiber amplifiers" Guided Wave Optical Components and Devices, Chapter 11, p173-180, Elsevier, 2005

CONFERENCE PROCEEDINGS EDITED SINCE 2000:

1. Testing, Reliability, and Applications of Optoelectronic Devices Ed. by A. K. Chin, N. K. Dutta, K. J. Linden and S. C. Wang, 24-26, Jan 2001, San Jose, CA

2. Testing and Measurement Applications of Optoelectronic Devices Ed. by A. K. Chin, N. K. Dutta, R. W. Herrick, K. J. Linden and D. J. McGraw, 21-22 Jan. 2002, San Jose, CA

3. Active and Passive Optical Components for WDM Communication Ed. by A. K. Dutta, A.A. S. Awwal, N. K. Dutta and K. Okamoto, 21-24, Aug. 2001, Denver, CO

4. Active and Passive Optical Components for WDM Communication II Ed. by A. K. Dutta, A. Awwal, N. K. Dutta and K. Okamoto, 29 July to 1 Aug, 2002, Boston, MA

5. Active and Passive Optical Components for WDM Communication III Ed. by A. K. Dutta, A. Awwal, N. K. Dutta and K. Fujiura, 8-11 Sept. 2003, Orlando, FL

6. Active and Passive Optical Components for WDM Communication IV Ed. by A. K. Dutta, A. Awwal, N. K. Dutta and Y. Ohishi, 25-28 Oct. 2004, Philadelphia, PA

7. Active and Passive Optical Components for WDM Communication V Ed. by A. K. Dutta, Y. Ohishi, N. K. Dutta and J. Moerk, 24-26 Oct. 2005, Boston, MA

8. Active and Passive Optical Components for WDM Communication VI Ed. by A. K. Dutta, Y. Ohishi, N. K. Dutta and J. Moerk, 3-4, Oct. 2006, Philadelphia, PA

9. Active and Passive Optical Components for WDM Communication VII Ed. by A. K. Dutta, Y. Ohishi, N. K. Dutta and A. V. Lavrinenko, 10-12 Sept. 2007, Boston, MA