

## **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), "Semiconductor Optical Amplifiers" (2006), and, "Semiconductor Optical Amplifiers" 2nd. edition (2013), Fiber Amplifiers and Fiber Lasers (2014). He has edited: " 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 Fellow of Connecticut Academy of Science and Engineering.

## CURRICULUM VITAE

**Niloy K. Dutta**

### **Business Address:**

Department of Physics  
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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- )  
Associate Head, Physics, (2015- )  
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 Associate, 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  
-13 amplifiers
- 2014 : Study of Coherence in supercontinuum generation, and, study of optical encryption  
-15
- 2016 : Study of fiber lasers and short pulse generation  
-17

#### **PUBLICATIONS:**

More than 350 publications, 20 review articles, 8 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  
Council Member and Chair of Broadband Committee – Connecticut Academy of Science and Engineering -  
2010 -

#### **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  
Chapter Chair, IEEE Connecticut Photonics Society Chapter, 1998-2011  
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, 2009-2014  
Editor-in-Chief: IEEE Photonics Journal, 2015 -

**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), Dr. S. Ma (2012), Dr. W. Li (2015), Dr. H. Hu (2016)

X. Zhang, S. Thapa

## **NILOY K. DUTTA - PUBLICATIONS**

### **I. 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 Co. 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, 2<sup>nd</sup>. Edition, July 2013
8. Fiber Amplifiers and Fiber Lasers, World Scientific, Singapore, December, 2014, N. K. Dutta

### **II. 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

### **III. 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



#### IV. ARTICLE PUBLICATION LIST

1. N. K. Dutta, R. T. Warner and G. J. Wolga, "Sensitivity Enhancement of a Spin Flip Raman Laser Absorption Spectrometer Through Use of an Intracavity Absorption Cell," *Opt. Lett.* 1, 155 (1977).
2. N. K. Dutta, "On Stimulated Recombination Radiation From n-InSb," *Phys. Lett. A* 67, 399 (1978).
3. N. K. Dutta, "Theory of Coherent Two-Photon Absorption," *Phys. Lett. A* 69, 21 (1978).
4. N. K. Dutta and G. J. Wolga, "On the Interaction of Stimulated Spin-Flip Raman Scattering and Stimulated Recombination Radiation in n-InSb," *Appl. Phys. Lett.* 19, 185 (1979).
5. N. K. Dutta, R. Tkach, D. Frolich, C. L. Tang, H. Mahr and P. L. Hartman, "Resonance Charge Transfer from a Photo-Excited donor State," *Phys. Rev. Lett.* 42, 175 (1979).
6. N. K. Dutta, "Theory of An Intracavity Raman Laser," *Opt. and Quant. Electronics* 11, 1 (1979).
7. N. K. Dutta, "Effect of Pump Fluctuations on Second Harmonic Generation and Parametric Amplification," *Opt. and Quant. Electronics* 11, 217 (1979).
8. N. K. Dutta, "Theory of the Four-Photon Parametric Oscillator," *Physica* 97C, 89 (1979).
9. N. K. Dutta, "Raman Induced Kerr Effect with Nonmonochromatic Waves," *J. Appl. Phys.* 51, 40 (1980).
10. N. K. Dutta, "Two-Photon Resonant Four Wave Mixing with Nonmonochromatic Waves," *J. Physics B* 13, 411 (1980).
11. N. K. Dutta, "Two-Photon Resonant Four Wave Parametric Amplification," *J. Appl. Phys.* 51, 84 (1980).
12. N. K. Dutta, R. J. Nelson and P. A. Barnes, "Temperature Dependence of Threshold and Electrical Characteristics of InGaAsP-InP DH Lasers," *Electron. Lett.* 16, 653 (1980).
13. R. J. Nelson and N. K. Dutta, "Self-Sustained Pulsations in InGaAsP (~ 1.3  $\mu$ m) Lasers: A Comparison of Nitride-Stripe and Buried-Waveguide Devices," *Proceedings of the 7<sup>th</sup> IEEE Intern'l Semiconductor Laser Conf.* Sept. 8-10, 1980, Brighton, Sussex, England.
14. N. K. Dutta and R. J. Nelson, "Temperature Dependence of Threshold of InGaAsP DH lasers and Auger Recombination," *Gallium Arsenide and Related Compounds*, 1980, Vol. 56, Institute of Physics, London, p. 193.
15. N. K. Dutta and R. J. Nelson, "Optical and Electrical Characteristics of Pulsating 1.3  $\mu$ m InGaAsP Double Heterostructure Lasers," *Proc. of Intern'l Electron Devices Mtg.* Dec. 8-10, 1980, Washington, DC, p. 378.
16. N. K. Dutta, "Laser Oscillator and Parametric Oscillator Under External Injection," *J. Appl. Phys.* 51, 5629 (1980).
17. R. J. Nelson and N. K. Dutta, "Self-Sustained Pulsations and Negative Resistance Behavior in InGaAsP Double Heterostructure Lasers," *Appl. Phys. Lett.* 37, 769 (1980).
18. N. K. Dutta, "Calculated Absorption, Emission and Gain in In<sub>0.72</sub>Ga<sub>0.28</sub>As<sub>0.6</sub>P<sub>0.4</sub>," *J. Appl. Physics* 51, 6095 (1980).
19. N. K. Dutta, "Gain-Current Relation for In<sub>0.72</sub>Ga<sub>0.28</sub>As<sub>0.6</sub>P<sub>0.4</sub> Lasers," *J. Appl. Phys.* 52, 55 (1981).
20. N. K. Dutta, "Calculated Temperature Dependence of Threshold Current of GaAs-Al<sub>x</sub>Ga<sub>1-x</sub>As Double Heterostructure Lasers," *J. Appl. Phys.* 52, 70 (1981).
21. R. J. Nelson, R. B. Wilson, P. D. Wright, P. A. Barnes and N. K. Dutta, "CW Electro-optical Properties of InGaAsP ( $\lambda = 1.3 \mu$ m) Buried Heterostructure Lasers," *IEEE J. Quantum Electron.* QE-17, 202 (1981).
22. N. K. Dutta and R. J. Nelson, "Temperature Dependence of Threshold of InGaAsP-InP DH Lasers and Auger Recombination," *Appl. Phys. Lett.* 38, 407 (1981).

23. N. K. Dutta and R. J. Nelson, "A Study of Pulsations, Superlinear Emission and Negative Resistance in 1.3  $\mu\text{m}$  InGaAsP Double Heterostructure Lasers," IEEE J. Quantum Electron. QE-17, 804 (1981).
24. N. K. Dutta and R. J. Nelson, "A Comparison of the Temperature Dependence of the Lasing Characteristics of 1.3  $\mu\text{m}$  InGaAsP and GaAs DH Lasers," IEEE Trans. Electron Devices ED-28, 1222 (1981).
25. N. K. Dutta and R. J. Nelson, "Auger Recombination in  $\text{In}_{1-x}\text{Ga}_x\text{As}_y\text{P}_{1-y}$ ," Proc. of International Electron Devices Mtg. Dec 7-9, 1981, Washington, DC, p. 456.
26. N. K. Dutta and R. J. Nelson, "Gain Measurements in 1.3  $\mu\text{m}$  InGaAsP-InP Double Heterostructure Lasers," IEEE J. Quantum Electron. QE-18, 44 (1982).
27. N. K. Dutta and R. J. Nelson, "The case for Auger Recombination in  $\text{In}_{1-x}\text{Ga}_x\text{As}_y\text{P}_{1-y}$ ," J. Appl. Phys. 53 74 (1982).
28. N. K. Dutta and R. J. Nelson, "Light Saturation of InGaAsP-InP LED's," IEEE J. Quantum Electron. QE-18, 375, (1982).
29. N. K. Dutta, "Temperature Dependence of Threshold Current of GaAs Quantum Well Lasers," Electron. Lett. 18, 451 (1982).
30. N. K. Dutta and R. J. Nelson, "Temperature Dependence of the Lasing Characteristics of the 1.3  $\mu\text{m}$  InGaAsP-InP and GaAs-Al<sub>0.36</sub>Ga<sub>0.64</sub>As DH Lasers," IEEE J. Quantum Electron. QE-18, 871 (1982).
31. N. K. Dutta, P. D. Wright, R. J. Nelson, R. B. Wilson and P. R. Besomi, "InGaAsP Laser with High  $T_0$ ," IEEE J. Quantum Electron. QE-18, 1414 (1982).
32. N. K. Dutta, "Calculated Threshold Current of GaAs Quantum Well Lasers," J. Appl. Phys. 53, 7122 (1982).
33. B. Sermage, H. J. Eichler, J. P. Heritage, R. J. Nelson and N. K. Dutta, "Photoexcited Carrier Lifetime and Auger Recombination in 1.3  $\mu\text{m}$  InGaAsP," Appl. Phys. Lett. 42, 259 (1983).
34. N. K. Dutta, "Calculation of Auger Rates in a Quantum Well Structure and Its Application to InGaAsP Quantum Well Lasers," J. Appl. Phys. 54, 1236 (1983).
35. N. K. Dutta, R. J. Nelson, P. D. Wright, P. Besomi and R. B. Wilson, "Optical Properties of a 1.3  $\mu\text{m}$  InGaAsP Superluminescent Diode," IEEE Trans. Electron Devices ED-30, 360 (1983).
36. N. K. Dutta and P. P. Deimel, "Optical Properties of a GaAlAs Superluminescent Diode," IEEE J. Quantum Electron. QE-19, 496 (1983).
37. N. K. Dutta, "Current Injection in Multiquantum Well Lasers," IEEE J. Quantum Electron. QE-19, 794 (1983).
38. R. J. Nelson and N. K. Dutta, "Calculated Auger Rates and Temperature Dependence of Threshold for Semiconductor Lasers Emitting at 1.3 and 1.55  $\mu\text{m}$ ," J. Appl. Phys. 54, 2923 (1983).
39. N. K. Dutta, R. L. Hartman and W. T. Tsang, "Gain and Carrier Lifetime Measurements in AlGaAs SQW Lasers," IEEE J. Quantum Electron. QE-19, 1243 (1983).
40. N. K. Dutta, R. L. Hartman and W. T. Tsang, "Gain and Carrier Lifetime Measurements in AlGaAs Multiquantum Well Lasers," IEEE J. Quantum Electron. QE-19, 1613 (1983).
41. G. P. Agrawal and N. K. Dutta, "Effect of Auger Recombination on the Threshold Characteristics of Gain-Guided InGaAsP Lasers," Electron. Lett. 19, 974 (1983).
42. N. K. Dutta, G. P. Agrawal and M. W. Focht, "Bistability in Coupled Cavity Semiconductor Lasers," Appl. Phys. Lett. 44, 30 (1984).
43. N. K. Dutta, "Effect of Uniaxial Stress on Optical Gain in Semiconductors," J. Appl. Phys. 55, 285 (1984).
44. N. A. Olsson, N. K. Dutta and K-Y Liou, "Dynamic Linewidth of Amplitude Modulated Single-Longitudinal-Mode Semiconductor Lasers Operating at 1.5  $\mu\text{m}$  Wavelength," Electron. Lett. 20, 121 (1984).
45. N. K. Dutta, D. P. Wilt, P. Besomi, W. C. Dautremont-Smith, P. D. Wright and R. J. Nelson, "Improved Linearity and Kink Criteria for 1.3  $\mu\text{m}$  InGaAsP-InP Channelled Substrate Buried Heterostructure Lasers," Appl. Phys. Lett. 44, 483 (1984).

46. O. E. Martinez, J. P. Heritage, B. I. Miller, N. K. Dutta and R. J. Nelson, "Threshold Temperature Dependence of Subnanosecond Optically Excited 1.3  $\mu\text{m}$  InGaAsP Lasers," *Appl. Phys. Lett.* 44, 578 (1984).
47. N. A. Olsson, N. K. Dutta, W. T. Tsang and R. A. Logan, "Threshold Current Characteristics of GaAs Lasers Under Short Pulse Excitation," *Electron. Lett.* 20, 63, (1984).
48. N. K. Dutta, R. J. Nelson, P. D. Wright and D. C. Craft, "Criterion for Improved Linearity of 1.3  $\mu\text{m}$  InGaAsP-InP Buried Heterostructure Lasers," *IEEE J. of Lightwave Technology*, LT-2, 160 (1984).
49. D. C. Craft, N. K. Dutta and W. R. Wagner, " and G. J. Zyzdik, Characteristics of 1.3  $\mu\text{m}$  InGaAsP Buried Heterostructure Lasers," *Appl. Phys. Lett.* 44, 823 (1984).
50. N. A. Olsson and N. K. Dutta, "Effect of External Optical Feedback on the Spectral Properties of Cleaved-Coupled-Cavity Semiconductor Lasers," *Appl. Phys. Lett.* 44, 840 (1984).
51. N. K. Dutta, N. A. Olsson, J. P. Heritage and P. L. Liu, "Temperature Dependence of Threshold Current of Injections Lasers for Short Pulse Excitation," *Appl. Phys. Lett.* 44, 943 (1984).
52. N. K. Dutta, D. P. Wilt and R. J. Nelson, "Analysis of Leakage Currents in 1.3  $\mu\text{m}$  InGaAsP Real-Index Guided Lasers," *J. of Lightwave Technology* LT-2, 201 (1984).
53. B. Schwartz, M. W. Focht, N. K. Dutta, R. J. Nelson and P. R. Besomi, "Stripe Geometry InP/InGaAsP Lasers Fabricated with Deuteron Bombardment," *IEEE Trans. Electron Devices* ED-31, 841 (1984).
54. P. Besomi, R. B. Wilson, R. L. Brown, N. K. Dutta, P. D. Wright and R. J. Nelson, "High Temperature Operation of 1.55  $\mu\text{m}$  InGaAsP Double-Channel-Buried-Heterostructure Lasers Grown by LPE," *Electron. Lett.* 20, 417 (1984).
55. N. A. Olsson, N. K. Dutta, P. Besomi, T. M. Shen, R. J. Nelson, R. A. Linke and R. S. Tucker, "2 Gb/s Operation of Single-Longitudinal-Mode 1.5  $\mu\text{m}$  Double-Channel Planar Buried-Heterostructure  $\text{C}^3$  Lasers," *Electron. Lett.* 20, 395 (1984).
56. N. A. Olsson, N. K. Dutta, R. A. Logan and P. Besomi, "Fiber-Dispersion and Propagation-Delay Measurements with Frequency- and Amplitude-Modulated Cleaved-Coupled Cavity Lasers," *Opt. Lett.* 9, 180 (1984).
57. N. K. Dutta and D. C. Craft, "Effect of Stress on the Polarization of Stimulated Emission from Injection Lasers," *J. Appl. Phys.* 56, 65 (1984).
58. G. P. Agrawal, N. A. Olsson and N. K. Dutta, "Reduced Chirping in Coupled-Cavity-Semiconductor Lasers," *Appl. Phys. Lett.* 45, 119 (1984).
59. G. P. Agrawal, N. A. Olsson and N. K. Dutta, "Effect of Fiber Far End Reflections on Intensity and Phase Noise of InGaAsP Semiconductor Lasers," *Appl. Phys. Lett.* 45, 597 (1984).
60. N. K. Dutta, R. J. Nelson, R. B. Wilson, D. M. Maher, P. D. Wright, T. T. Sheng, P. S. D. Lin and R. B. Marcus, "Effect of Active Layer Placement on the Threshold Current of 1.3  $\mu\text{m}$  InGaAsP Etched Mesa Buried Heterostructure Lasers," *Appl. Phys. Lett.* 45, 337 (1984).
61. N. K. Dutta, N. A. Olsson, L. A. Koszi, P. Besomi, R. B. Wilson and R. J. Nelson, "Frequency Chirp Under Current Modulation in InGaAsP Injection Lasers," *J. Appl. Phys.* 56, 2167 (1984).
62. N. K. Dutta, N. A. Olsson and K-Y Liou, "Effect of External Optical Feedback on the Spectral Properties of External Cavity Semiconductor Lasers," *Electron. Lett.* 20, 588 (1984).
63. G. P. Agrawal and N. K. Dutta, "Optical Bistability in Coupled-Cavity Semiconductor Lasers," *J. Appl. Phys.* 56, 664 (1984).
64. N. K. Dutta and N. A. Olsson, "Electroabsorption in InGaAsP-InP Double Heterostructures," *Electron. Lett.* 20, 634 (1984).

65. N. K. Dutta, N. A. Olsson and W. T. Tsang, "Carrier Induced Refractive Index Change in AlGaAs Quantum Well Lasers," *Appl. Phys. Lett.* 45, 636 (1984).
66. N. K. Dutta, S. G. Napholtz, R. B. Wilson, R. L. Brown, T. Cella and D. C. Craft, "High Power Gain Guided InGaAsP Laser Array," *Appl. Phys. Lett.* 45, 941 (1984).
67. N. K. Dutta, N. A. Olsson and T. M. Shen, "Temperature Behavior of Optical Absorption in InGaAsP Lasers," *Appl. Phys. Lett.* 45, 1023 (1984).
68. N. K. Dutta, S. G. Napholtz, R. Yen, R. L. Brown, T. M. Shen, N. A. Olsson and D. C. Craft, "1.3  $\mu\text{m}$  InGaAsP DCPBH Multiquantum-Well Lasers," *Electron. Lett.* 20, 727 (1984).
69. P. Besomi, J. Degani, N. K. Dutta, W. R. Wagner and R. J. Nelson, "High Quality Indium Gallium Arsenide Phosphide Double Heterostructure Material Grown by the Near Equilibrium Liquid-Phase-Epitaxy Technique," *J. Appl. Phys.* 56, 2878 (1984).
70. T. M. Shen and N. K. Dutta "Temperature Behavior of Optical Absorption in InGaAsP Lasers," *Appl. Phys. Lett.* 45, 1262 (1984).
71. D. P. Wilt, R. F. Karlicek, K. E. Strege, W. C. Dautremont-Smith, N. K. Dutta, E. J. Flynn, W. D. Johnston, Jr. and R. J. Nelson, "Channelled Substrate Buried Heterostructure InGaAsP/InP Lasers with Vapor Phase Epitaxial Base Structure and Liquid Phase Epitaxial Regrowth," *J. Appl. Phys.* 46, 710 (1984).
72. N. K. Dutta, S. G. Napholtz, R. Yen, R. L. Brown, T. M. Shen, N. A. Olsson and D. C. Craft, "Fabrication and Performance Characteristics of InGaAsP Multiquantum Well Double Channel Planar Buried Heterostructure Lasers," *Appl. Phys. Lett.* 46, 19 (1985).
73. N. K. Dutta, D. C. Craft and S. G. Napholtz, "Gain Measurements in InGaAsP Multiquantum Well Lasers," *Appl. Phys. Lett.* 46, 123 (1985).
74. G. P. Agrawal and N. K. Dutta, "Polarization Characteristics of Distributed Feedback Semiconductor Lasers," *Appl. Phys. Lett.* 46, 213 (1985).
75. N. K. Dutta, T. Wessel, N. A. Olsson, R. A. Logan, L. A. Koszi and R. Yen, "Fabrication and Performance Characteristics of 1.55  $\mu\text{m}$  InGaAsP Multiquantum Well Ridge Guide Lasers," *Appl. Phys. Lett.* 46, 525 (1985).
76. F. R. Nash, W. J. Sundberg, R. L. Hartman, J. R. Pawlik, D. A. Ackerman, N. K. Dutta and R. W. Dixon, "Implementation of the Proposed Reliability Assurance Strategy for an InGaAsP/InP, Planar Mesa, Buried Heterostructure Laser Operating at 1.3  $\mu\text{m}$  for Use in a Submarine Cable," *AT&T Tech. J.* 64, 861 (1985).
77. N. A. Olsson, W. T. Tsang, H. Temkin, N. K. Dutta and R. A. Logan, "Bit-Error-Rate Saturation Due to Mode-Partition Noise Induced by Optical Feedback in 1.5  $\mu\text{m}$  Single Longitudinal Mode  $\text{C}^3$  and DFB Semiconductor Lasers," *IEEE J. Lightwave Tech.*, LT-3, 215 (1985).
78. N. A. Olsson, H. Temkin, J. P. Van der Ziel, N. K. Dutta and R. A. Logan, "Single and Multimode Fiber Bandwidth Measurements with Single and Multilongitudinal Mode Lasers Operating at 0.8, 1.3 and 1.5  $\mu\text{m}$  wavelength," *IEEE J. Lightwave Tech.* LT-3, 695 (1985).
79. B. Sermage, J. P. Heritage and N. K. Dutta, "Temperature Dependence of Carrier Lifetime and Auger Recombination in 1.3  $\mu\text{m}$  InGaAsP," *J. Appl. Phys.* 57, 5443 (1985).
80. N. K. Dutta, T. Cella, S. G. Napholtz and D. C. Craft, "1.3  $\mu\text{m}$  InGaAsP Index Guided Multirib Waveguide Laser Array," *Electron. Lett.* 21, 326 (1985).
81. N. K. Dutta, L. A. Koszi, B. P. Segner, D. C. Craft and S. G. Napholtz, "High Power Index Guided Multiridge Waveguide Laser Array," *Appl. Phys. Lett.* 46, 803 (1985).
82. N. K. Dutta, S. G. Napholtz, R. Yen, T. Wessel, T. M. Shen and N. A. Olsson, "Long Wavelength InGaAsP ( $\sim 1.3 \mu\text{m}$ ) Modified Multiquantum Well Laser," *Appl. Phys. Lett.* 46, 1036 (1985).
83. N. K. Dutta, T. Wessel, N. A. Olsson, R. A. Logan, R. Yen and P. J. Anthony, "Fabrication and Performance Characteristics of InGaAsP Ridge-Guide Distributed-Feedback Multiquantum Well Lasers," *Electron. Lett.* 21, 571 (1985).

84. N. K. Dutta, T. Cella, R. L. Brown and D. T. C. Huo, "Monolithically Integrated Thermoelectric Controlled Laser Diode," *Appl. Phys. Lett.* 47, 222 (1985).
85. F. R. Nash, W. J. Sundberg, R. L. Hartman, J. R. Pawlik, D. A. Ackerman, N. K. Dutta and R. W. Dixon. "Implementation of the Proposed Reliability Assurance Strategy for an InGaAsP/InP, Planar Mesa, Buried Heterostructure Laser Operating at 1.3  $\mu\text{m}$  for Use in a Submarine Cable," *AT&T Tech. J.* 64, 861 (1985).
86. C. H. Henry, N. A. Olsson and N. K. Dutta "Locking Range and Stability of Injection Locked 1.54  $\mu\text{m}$  InGaAsP Semiconductor Lasers," *IEEE J. Quantum Electron.* QE-21, 1152 (1985).
87. G. P. Agrawal and N. K. Dutta "Analysis of Ridge-Waveguide Distributed Feedback Lasers," *IEEE J. Quantum Electron.* QE-21, 534 (1985).
88. N. K. Dutta, E. I. Gordon, T. M. Shen, P. J. Anthony and G. Zyzdik, "Single Longitudinal Mode Operation of a Semiconductor Laser Using a Metal Film Reflection Filter," *IEEE J. Quantum Electron.* QE-21, 559 (1985).
89. N. K. Dutta, T. Wessel, T. Cella and R. L. Brown, "Continuously Tunable Distributed Feedback Laser Diode," *Appl. Phys. Lett.* 47, 981 (1985).
90. N. K. Dutta, R. B. Wilson, D. P. Wilt, P. Besomi, R. L. Brown, R. J. Nelson and R. W. Dixon, "Performance Comparison of InGaAsP Lasers Emitting at 1.3  $\mu\text{m}$  and 1.55  $\mu\text{m}$  for Lightwave System Applications," *AT&T Tech. J.* 64, 1857 (1985).
91. L. A. Koszi, A. K. Chin, B. P. Segner, T. M. Shen and N. K. Dutta, "1.3  $\mu\text{m}$  InP/InGaAsP Channelled-Substrate Buried-Heterostructure Laser Monolithically Integrated with a Photodetector," *Electron. Lett.* 21, 1209 (1985).
92. R. J. Nelson and N. K. Dutta, "Review of InGaAsP-InP Laser Structures and Comparison of their Performance," *Semiconductors and Semimetal*, Vol. 22, Part C. R. K. Willardson and A. C. Beer (Eds.). W. T. Tsang (Vol. Ed) Academic Press, NY (1985).
93. N. K. Dutta, L. A. Koszi, B. P. Segner and S. G. Napholtz, "InGaAsP Ridge Waveguide Laser Array with Nonuniform Spacing," *Appl. Phys. Lett.* 48, 312 (1986).
94. G. P. Agrawal, N. K. Dutta and P. J. Anthony, "Linewidth of Distributed Feedback Semiconductor Lasers with Partially Reflecting Facets," *Appl. Phys. Lett.* 48, 457 (1986).
95. N. K. Dutta, S. G. Napholtz, T. Cella, T. Wessel, R.L.Brown and P. J. Anthony, "1.3  $\mu\text{m}$  InGaAsP Distributed Feedback Laser," *J. Appl. Phys.* 59, 1811 (1986).
96. N. K. Dutta, S. G. Napholtz, A. B. Piccirilli and G. Przybylek, "InGaAsP Distributed Feedback Multiquantum Well Laser," *Appl. Phys. Lett.* 48, 1419 (1986).
97. N. K. Dutta, A. B. Piccirilli, T. Cella and R. L. Brown, "Electronically Tunable Distributed Feedback Lasers," *Appl. Phys. Lett.* 48, 1501 (1986).
98. N. K. Dutta, J. L. Zilko, T. Cella, D. A. Ackerman, T.M. Shen and S. F. Napholtz, "InGaAsP Laser with Semi-Insulating Current Confining Layers," *Appl. Phys. Lett.* 48, 1572 (1986).
99. N. K. Dutta, T. Cella, J. L. Zilko, D. A. Ackerman, A. B. Piccirilli and L. I. Greene, "InGaAsP Closely Spaced Dual Wavelength Laser," *Appl. Phys. Lett.* 48, 1752 (1986).
100. N. K. Dutta, T. Cella, A. B. Piccirilli and R. L. Brown, "Integrated External Cavity Laser," *Appl. Phys. Lett.* 49, 1227 (1986).
101. G. P. Agrawal and N. K. Dutta, "Long Wavelength Semiconductor Lasers," Van Nostrand Reinhold Company Inc., NY (1986).
102. N. K. Dutta, "Optical Sources for Lightwave System Application," in *Fiber Optics Technology*, ed. by E.E. Basch, Howard Sams & Co. (1986).
103. G. P. Agrawal and N. K. Dutta "Distributed Feedback InGaAsP Lasers," *J. of Ins. of Elec. and Telecom. Eng.* 32, 187 (1986).

104. N. K. Dutta, "Physics of Quantum Well Lasers," in "Heterojunctions: A Modern View of Band Discontinuities and Device Applications," ed. by F. Capasso and G. Margaritondo, North Holland (1987) p. 565.
105. K. Y. Liou, N. K. Dutta and C. A. Burns "Linewidth-Narrowed Distributed Feedback Injection Lasers with Long Cavity Length and Detuned Bragg Wavelength," Appl. Phys. Lett. 50, 489 (1987).
106. R. W. Dixon and N. K. Dutta "Lightwave Device Technology," AT&T Tech. Journal 66, 73 (1987).
107. A. B. Piccirilli, N. K. Dutta, S. G. Napholtz, T. Cella and R. L. Brown, "1.3  $\mu\text{m}$  Integrated External Cavity Distributed Bragg Reflector Laser," Appl. Phys. Lett. 62, 308 (1987).
108. N. K. Dutta, T. Cella, J. L. Zilko, A. B. Piccirilli, R. L. Brown and S. G. Napholtz, "Integrated External Cavity Distributed Feedback Bragg Reflector Laser," Appl. Phys. Lett. 50 644 (1987).
109. T. Cella, N. K. Dutta, A. B. Piccirilli and R. L. Brown, "Monolithically Integrated Thermoelectrically Tunable Distributed Bragg Reflector Laser," Electron. Lett. 23, 1031 (1987).
110. L. A. Koszi, H. Temkin, G. J. Przybylek, B. P. Segner, S. G. Napholtz, C. M. Bogdanowicz and N. K. Dutta, "High Power Operation of InGaAsP Double Channel Planar Buried Heterostructure Lasers with Asymmetric Facet Coatings," Appl. Phys. Lett. 51, 2219 (1987).
111. Y. K. Park, S. W. Granlund, C. Y. Kuo, M. Dixon, T. W. Cline, R. W. Smith, N. K. Dutta and G. Vannucci, "Crosstalk Penalty in a Two-Channel ASK Heterodyne Detection System with Nonnegligible Laser Linewidth," Electron. Lett. 23, 1291 (1987).
112. N. K. Dutta, T. Cella, A. B. Piccirilli and R. L. Brown, "Tunable Single Wavelength Lasers," SPIE 800, 56 (1987).
113. C. A. Green, N. K. Dutta and W. Watson, "Linewidth Enhancement Factor in InGaAsP/InP Multiple Quantum Well Laser," Appl. Phys. Lett. 50, 1409 (1987).
114. N. K. Dutta and N. A. Olsson, "Electroabsorption in GaAs Quantum Well Waveguides," Electron. Lett. 23, 853 (1987).
115. N. K. Dutta, "Reliability of InGaAsP Semiconductor Lasers," SPIE 842, 58 (1987).
116. N. K. Dutta, "Recent Advances in Lightwave Source and Detector Technologies," Electro/87 (1987).
117. N. K. Dutta, T. Cella, A. B. Piccirilli, R. L. Brown and C. Green, "Chirp and CW Linewidth Measurements of Integrated External Cavity Lasers," Appl. Phys. Lett. 52, 91 (1988).
118. Y. Twu, N. K. Dutta, C. A. Green and J. D. Wynn, "GaInAsP Distributed Feedback Laser Array," Electron. Lett. 24, 743 (1988).
119. C. Y. Kuo and N. K. Dutta, "Characteristics of Two-Electrode DFB Lasers," Electron. Lett. 24, 947 (1988).
120. Y. K. Park, S. W. Granlund, L. D. Tzeng, N. A. Olsson and N. K. Dutta, "Crosstalk in a Two-Channel Coherent Fiber Optic ASK System Using an Optical Amplifier and Nonnegligible Linewidth Lasers," Electron. Lett. 24, 475 (1988).
121. N. K. Dutta, J. L. Zilko, A. B. Piccirilli and R. L. Brown, "Monolithically Integrated Laser/Photodetector," Electron. Lett. 24, 335 (1988).
122. A. H. Gnack, B. L. Kasper, N. K. Dutta and T. Cella, "8 Gbit/s Transmission over 76 km of Optical Fibre Using a Directly Modulated  $\sim 1.3 \mu\text{m}$  DFB Laser," Electron. Letts. 24, 510 (1988).
123. N. K. Dutta, Y. Twu, C. Y. Kuo, A. B. Piccirilli and R. L. Brown, "Single Wavelength Lasers for Coherent Transmission," SPIE Proc. 992, 287 (1988).
124. A. B. Piccirilli, N. K. Dutta, L. A. Greuzka, R. F. Karlicek and J. D. Wynn, "GaInAsP Dual Wavelength Laser," Electron. Letts. 24, 1565 (1988).
125. N. K. Dutta and C. L. Zipfel, "Reliability of Lasers and LEDs," in "Optical Fiber Telecommunications II," Academic Press (1988) p. 671.

126. N. K. Dutta, "Long Wavelength Semiconductor Lasers," IEDM Technical Digest, 304 (1988).
127. S. J. Wang and N. K. Dutta, "Intermodulation and Harmonic Distortion in GaInAsP Distributed Feedback Lasers," *Electron. Lett.* 25, 850 (1989).
128. N. K. Dutta "III-V Device Technologies for Lightwave Applications," *AT&T Tech. J.* 68, 5 (1989).
129. S. J. Wang, N. K. Dutta, and A. H. Gnauck, "Dynamic and CW Linewidth Measurements of Buried Heterostructure Distributed Feedback Lasers," *Photonics Tech. Lett.* 1, 215 (1989).
130. S. J. Wang, T. M. Shen and N. K. Dutta, "Temperature Dependence of the Bandwidth of Buried Heterostructure Distributed Feedback Lasers," *Photonics Tech. Lett.* 1, 258 (1989).
131. P. C. Becker, J. R. Simpson, N. A. Olsson and N. K. Dutta, "High Gain and High Efficiency Diode Laser Pumped Fiber Amplifier at 1.56  $\mu\text{m}$ ," *Photonics Tech. Lett.* 1, 267 (1989).
132. Y. Twu, R. F. Karlicek, J. D. Wynn, C. A. Green, C. B. Roxlo, and N. K. Dutta, "Performance Characteristics of Buried Facet Quarter Wave Shifted Distributed Feedback Lasers," *Electron. Lett.* 25, 1045 (1989).
133. A. H. Gnauck, R. M. Jopson, C. A. Burrus, S. J. Wang and N. K. Dutta, "16 Gb/s Transmission Experiments Using a Directly Modulated 1.3  $\mu\text{m}$  DFB Laser," *IEEE Photonics Tech. Lett.* 1, 337 (1989).
134. C. Y. Kuo, Y. Twu, N. K. Dutta, E. J. Wagner and S. W. Granlund, "Frequency Modulation Responses of Two-Electrode Distributed Feedback Lasers," *Appl. Phys. Lett.* 55, 1279 (1989).
135. A. H. Gnauck, C. A. Burrus, S. J. Wang and N. K. Dutta, "16 Gbit/s Transmission Over 53 km of Fibre Using Directly Modulated 1.3  $\mu\text{m}$  DFB laser," *Electron. Letts.* 25, 1356 (1989).
136. M. S. Lin, A. B. Piccirilli, Y. Twu and N. K. Dutta, "Fabrication and Gain Measurements for Buried Facet Optical Amplifiers," *Electron. Lett.* 25, 1378 (1989).
137. N. K. Dutta, S. J. Wang, A. B. Piccirilli, R. F. Karlicek, R. L. Brown, M. Washington and U. K. Chakrabarti, "Wide Bandwidth and High Power InGaAsP Distributed Feedback Lasers," *J. Appl. Phys.* 66, 4640 (1989).
138. N. K. Dutta and P. Parayanthal, "Performance Characteristics and Reliability of Distributed Feedback Semiconductor Lasers," *SPIE Proceedings* 1174, 80 (1989).
139. S. J. Wang, N. K. Dutta, A. B. Piccirilli and M. S. Lin, "Nonlinearity of Buried Heterostructure Lasers Under Amplitude Modulation," *SPIE Proceedings* 1174, 76 (1989).
140. N. K. Dutta and A. B. Piccirilli, "Observations of Anomalous Far Field Intensity Distributions in Semiconductor Lasers and Their Explanation," *J. Appl. Phys.* 66, 4621 (1989).
141. H. Temkin, T. Tanbun-Ek, R. A. Logan, J. A. Lewis and N. K. Dutta, "InGaAs/InP Graded Index Quantum Well Lasers with Nearly Ideal Static Characteristics," *Appl. Phys. Lett.* 56, 1222 (1990).
142. N. K. Dutta, A. B. Piccirilli, M. S. Lin, R. L. Brown, J. Wynn, D. Coblenz, Y. Twu and U. K. Chakrabarti, "Fabrication and Performance Characteristics of Buried Facet Optical Amplifiers," *J. Appl. Phys.* 67, 3943 (1990).
143. N. K. Dutta, J. Wynn, D. L. Sivco and A. Y. Cho, "Linewidth Enhancement Factor in Strained Quantum Well Lasers," *Appl. Phys. Lett.* 56, 2293 (1990).
144. M. S. Lin, S. J. Wang and N. K. Dutta "Temperature Dependence of Harmonic Distortion in InGaAsP Distributed Feedback Lasers," *J. Appl. Phys.* 67, 6661 (1990).
145. Y. Twu, S. J. Wang, C. Y. Kuo, J. D. Wynn, R. L. Brown, L. A. Gruezeke, K. E. Strege, M. S. Lin and N. K. Dutta, "Long-Cavity Multi-Electrode DFB Lasers for Coherent FSK Systems," *Electron. Lett.* 26, 708 (1990).
146. T. W. Cline, J. M. Delavaux, N. K. Dutta, P. V. Eijk, C. Y. Kuo, B. Owen, Y. K. Par, T. C. Pleiss, R. S. Riggs, R. E. Tench, Y. Twu, L. D. Tzeng and E. J. Wagner, "A Field of

- Demonstration of 1.7 Gb/s Coherent Lightwave Regenerators," IEEE Photonics Tech. Lett. 2, 425 (1990).
147. M.-S. Lin, S.-Y. J. Wang and N. K. Dutta, "Measurements and Modeling of the Harmonic Distortion in InGaAsP Distributed Feedback Lasers," IEEE J. Quantum Elect. 26, 998 (1990).
  148. N. K. Dutta, "Analysis of Current Spreading, Carrier Diffusion, and Transverse Mode Guiding in Surface Emitting Lasers," J. Appl. Phys. 68, 1961 (1990).
  149. N. K. Dutta, H. Temkin, T. Tanbun-Ek and R. Logan, "Linewidth Enhancement Factor for InGaAs/InP Strained Quantum Well Lasers," Appl. Phys. Lett. 57, 1390 (1990).
  150. H. Temkin, N. K. Dutta, T. Tanbun-Ek, R. A. Logan and A. M. Sergent, "InGaAs/InP Quantum Well Lasers with sub-mA Threshold Current," Appl. Phys. Lett. 57, 1610 (1990).
  151. S. J. Wang, A. B. Piccirilli, Y. J. Wang and N. K. Dutta, "Temperature Dependence of Second Order Harmonic Distortion of Buried Heterostructure DFB Lasers Under Intensity Modulation," Electron. Lett. 26, 1095 (1990).
  152. N. K. Dutta, A. B. Piccirilli, M. S. Lin and T. R. Halemane, "Monitoring the Performance of Semiconductor Optical Amplifier," Appl. Phys. Lett. 57, 659 (1990).
  153. N. K. Dutta, J. D. Wynn, D. L. Sivco, A. Y. Cho and G. J. Zyzdik, "Performance Characterization of In<sub>0.2</sub>Ga<sub>0.8</sub>As/GaAs Multiquantum Well Lasers," J. Appl. Phys. 68, 3822 (1990).
  154. S. J. Wang, Y. Twu, N. K. Dutta and R. L. Hartman, "Two Section Distributed Feedback Lasers for Incoherent Frequency Shift Keying Transmission Systems," Electronics Lett. 26, 1243 (1990).
  155. N. K. Dutta, S. J. Wang, A. B. Piccirilli and W. V. Werner, "Crosstalk Measurements for a Dual Emitter Laser," Electronics Lett. 26, 1643 (1990).
  156. N. K. Dutta, J. D. Wynn, J. Lopata, D. L. Sivco and A. Y. Cho, "High Power InGaAs/GaAs Laser Array," Electronics Lett. 26, 1816 (1990).
  157. M.-S. Lin, A. B. Piccirilli, Y. Twu and N. K. Dutta, "Temperature Dependence of Polarization Characteristics in Buried Facet Semiconductor Laser Amplifiers," IEEE Journal of Quantum Electronics 26, 1772 (1990).
  158. S.-J. Wang, Y. J. Wang, N. K. Dutta and Y. Twu, "FM Response of InGaAsP Buried Heterostructure Distributed Feedback Lasers and Their Applications in Incoherent FSK Systems, 8, 1769 (1990).
  159. N. K. Dutta, J. Lopata, D. L. Sivco and A. Y. Cho, "InGaAs/GaAs Strained Quantum Well Lasers," Mat. Res. Soc. Extended Abstract EA-21, 291 (1990).
  160. N. K. Dutta, "Semiconductor Lasers for Coherent Lightwave Communication," SPIE 1372, 4 (1990).
  161. N. K. Dutta, "Advances in Quantum Well Lasers," Mat. Res. Soc. Extended Abstract EA-21, 25 (1990).
  162. N. K. Dutta, L. W. Tu, G. Hasnain, G. Zyzdik, Y. H. Wang and A. Y. Cho, "Anomalous Temporal Response of Gain Guided Surface Emitting Lasers," Electronics Letters 2, 208 (1991).
  163. N. K. Dutta, J. Lopata, D. L. Sivco and A. Y. Cho, "Temperature Dependence of Threshold of Strained Quantum Well Lasers," Appl. Phys. Lett. 58, 1125 (1991).
  164. Naresh Chand, E. E. Becker, J. P. van der Ziel, S. N. G. Chu and N. K. Dutta, "Excellent Uniformity and Very Low (<50 A/cm<sup>2</sup>) Threshold Current Density Strained InGaAs Quantum Well Diode Lasers on GaAs Substrate," Appl. Phys. Lett. 58, 1704 (1991).
  165. N. K. Dutta, J. Lopata, P. R. Berger, D. L. Sivco and A. Y. Cho, "Performance Characteristics of GaInAs/GaAs Large Optical Cavity Quantum Well Lasers," Electronics Letters 27, 680 (1991).
  166. S. J. Wang, T. Twu, T. Tanbun-Ek, R. A. Logan, N. K. Dutta and A. B. Piccirilli, "Narrow-Linewidth Strained-Layer 1.5 μm Multiquantum Well Distributed Feedback Lasers," Electronics Letters 27, 645 (1991).



167. N. K. Dutta, N. A. Olsson, H. K. Temkin and R. A. Logan, "Linewidth Enhancement Factor and High Temperature Performance of 1.48  $\mu\text{m}$  Strained InGaAs-InGaAsP Multiquantum Well Lasers," IEEE Journal of Quantum Electronics, 27, 678 (1991).
168. P. R. Berger, N. K. Dutta, J. Lopata, S. N. G. Chu and Naresh Chand, "Monolithic Integration of GaAs and In<sub>0.2</sub>Ga<sub>0.8</sub>As Lasers by Molecular Beam," Appl. Phys. Lett. 58, 2698 (1991).
169. Paul R. Berger, Niloy K. Dutta, Kent D. Choquette, Ghulam Hasnain and Naresh Chand, "Monolithically Peltier-cooled vertical-cavity surface-emitting lasers," Appl. Phys. Lett. 59, 117 (1991).
170. C. R. Giles, C. A. Burrus, D. J. DiGiovanni, N. K. Dutta, "Characterization of Erbium-Doped Fibers and Application to Modeling 980-nm and 1480-nm Pumped Amplifiers," IEEE Photonics Technology Letters 3, 363 (1991).
171. Naresh Chand, Paul R. Berger and Niloy K. Dutta, "Substantial Improvement by Substrate Misorientation in dc Performance of Al<sub>0.5</sub>Ga<sub>0.5</sub>As/GaAs/Al<sub>0.5</sub>Ga<sub>0.5</sub>As Double-Heterojunction NpN Bipolar Transistors Grown by Molecular Beam Epitaxy," Appl. Phys. Lett. 59, 186 (1991).
172. Ghulam Hasnain, Kuochou Tai, L. Yang, Y. H. Wang, R. J. Fischer, James D. Wynn, Bonnie Weir, Niloy K. Dutta and Alfred Y. Cho, "Performance of Gain-Guided Surface Emitting Lasers with Semiconductor Distributed Bragg Reflectors," IEEE J. of Quantum Electron. 27, 1377 (1991).
173. N. K. Dutta, J. Lopata, D. L. Sivco and A. Y. Cho, "High-Speed Modulation and Nonlinear Damping Effect in InGaAs/GaAs Lasers," J. Appl. Phys. 70, 2476 (1991).
174. Paul R. Berger, Naresh Chand and Niloy K. Dutta, "An AlGaAs Double-Heterojunction Bipolar Transistor Grown by Molecular-Beam Epitaxy," Appl. Phys. Lett. 59, 1099 (1991).
175. N. K. Dutta, J. Lopata, R. Logan and T. Tanbun-Ed, "Integrated Distributed Feedback Laser and Optical Amplifier," Appl. Phys. Lett. 59, 1676 (1991).
176. N. Chand, N. K. Dutta, S. N. G. Chu and J. Lopata, "(InAs)<sub>1</sub>/(GaAs)<sub>4</sub> Superlattice Strained Quantum Well Laser at 980 nm," Electronics Letters 27, 2009 (1991).
177. J. Lopata, N. K. Dutta, R. A. Gottscho, G. R. Scheller, D. L. Sivco and A. Y. Cho, "Fabrication of InGaAs/GaAs Lasers Using Reactive Ion Etching," Fourteenth State-of-the-Art Program on Compound Semiconductors (SOTAPOCS XIV), Eds. D. N. Buckley and A. T. Macrander, Vol. 91-13, 103 (1991).
178. G. Hasnain, K. Tai, N. K. Dutta, Y. H. Wang, J. D. Wynn, B. E. Weir and A. Y. Cho, "High Temperature and High Frequency Performance of Gain-Guided Surface Emitting Lasers," Electronics Letters 27, 915 (1991).
179. G. Hasnain, K. Tai, Y. H. Wang, J. D. Wynn, K. D. Choquette, B. E. Weir, N. K. Dutta and A. Y. Cho, "Monolithic Integration of Photodetector with Vertical Cavity Surface Emitting Laser," Electronics Letters 27, 1630 (1991).
180. P. R. Berger, N. K. Dutta, D. L. Sivco and A. Y. Cho, "GaAs Quantum Well Laser and Heterojunction Bipolar Transistor Integration Using Molecular Beam Epitaxial Regrowth," Appl. Phys. Lett. 59, 2826 (1991).
181. N. Chand, N. K. Dutta, S. N. G. Chu, W. S. Hobson, J. Lopata and R. Wetzel, "Fabrication, Performance and Reliability of Strained InGaAs QW Lasers," SPIE 1580, 22 (1991).
182. N. K. Dutta, J. Lopata, R. Logan and T. Tanbun-Ek, "Integrated Distributed Feedback Laser and Optical Amplifier, Mat. Res. Soc. Symp. Proc. 240, 543 (1992).
183. N. K. Dutta, S. J. Wang, J. D. Wynn, J. Lopata and R. A. Logan, "Investigations of Laser Array for Parallel Data Link Applications," Appl. Phys. Lett. 61, 130 (1992).
184. N. K. Dutta, N. Chand, J. Lopata and R. Wetzel, "(InAs)<sub>1</sub>/(GaAs)<sub>4</sub> Superlattices Quantum Well Laser," Appl. Phys. Lett. 60, 924 (1992).
185. N. Chand, N. K. Dutta and J. Lopata, "(InAs)<sub>1</sub>/(GaAs)<sub>4</sub> Superlattices Strained Quantum Well Lasers," SPIE Proceedings Series 1634, 367 (1992).

186. N. K. Dutta, N. Chand and J. Lopata, "Carrier Induced Change in Index, Gain and Lifetime for  $(\text{InAs})_1/(\text{GaAs})_4$  Superlattice Lasers," *Appl. Phys. Lett.* 61, 7 (1992).
187. P. R. Berger, N. K. Dutta, D. A. Humphrey, P. R. Smith, S.-J. Wang, R. K. Montgomery, D. Sivco and A. Y. Cho, "1.0 GHz Monolithic p-i-n MODFET Photoreceiver Using Molecular Beam Epitaxial Regrowth," *IEEE Photonics Tech. Lett.* 4, 891 (1992).
188. J. Lopata, N. K. Dutta, W. S. Hobson and P. R. Berger, "Buried Heterostructure Lasers Using a Single-Step Metal Organic Chemical Vapor Deposition Growth Over Patterned Substrates," *SPIE Proceedings Series 1976*, 117 (1992).
189. N. K. Dutta, "Growth and Performance of Surface Emitting Lasers," *SPIE Proceedings Series 1676*, 102 (1992).
190. Naresh Chand, N. K. Dutta, J. Lopata and R. Hull, "MBE Growth of  $(\text{GaAs})_m/(\text{AlAs})_n$  Short-Period Superlattices and Their Application in Fabricating Visible Lasers," *SPIE Proceedings Series 1676*, 145 (1992).
191. Paul R. Berger, Niloy K. Dutta, George Zydzik, H. M. O'Bryan, Ursula Keller, Peter R. Smith, John Lopata, D. Sivco and A. Y. Cho, " $\text{In}_{0.53}\text{Ga}_{0.47}\text{As}$  p-i-n Photodiodes with Transparent Cadmium Tin Oxide Contacts," *Appl. Phys. Lett.* 61, 1673 (1992).
192. S. L. McCall and N. K. Dutta, "Diode Lasers Invigorate Communication Technologies," *Laser Focus World*, 75 (1992).
193. N. K. Dutta, N. Chand, J. Lopata and R. Wetzel, "Performance Characteristics of  $(\text{InAs})_{\text{sub }1}/(\text{GaAs})_{\text{sub }n}$  Short-Period Superlattice Quantum-Well Laser," *Electronics Letters* 28, 2326 (1992).
194. N. K. Dutta, "Advances in Quantum Well Lasers," *Proceedings of the Conference on Emerging Optoelectronic Technologies* titled *Emerging Optoelectronic Technologies*, Tata McGraw-Hill Publishing Company Limited, New Delhi (1992).
195. N. K. Dutta, "InGaAs/GaAs Strained Quantum Well Lasers," *SPIE* 1788, 102 (1992).
196. Naresh Chand, T. D. Harris, S. N. G. Chu, E. A. Fitzgerald, J. Lopata, M. Schnoes and N. K. Dutta, "Performance of a Valved Arsenic Cracker Source for MBE Growth," *J. Cryst. Growth* 126, 530 (1993).
197. P. R. Berger, N. K. Dutta, D. A. Humphrey, P. R. Smith, S.-J. Wang, R. K. Montgomery, D. L. Sivco and A. Y. Cho, "8-Element Linear Array Monolithic p-i-n MODFET Photoreceivers Using Molecular Beam Epitaxial Regrowth," *IEEE Photonics Technology Letters* , 63 (1993).
198. P. R. Berger, S. N. G. Chu, R. A. Logan, E. Byrne, D. Coblenz, J. W. Lee, III, N. T. Ha and N. K. Dutta, "Substrate Orientation Effects on Dopant Incorporation in InP Grown by Metalorganic Chemical Vapor Deposition," *J. Appl. Phys.* 73, 4095 (1993).
199. N. K. Dutta, Naresh Chand, J. Lopata and R. Wetzel, "Temperature Characteristics of  $(\text{InAs})_1/(\text{GaAs})_4$  Short-Period Superlattices Quantum Well Laser," *Appl. Phys. Lett.* 62, 2018 (1993).
200. P. K. Bhattacharya and N. K. Dutta, "Quantum Well Optical Devices and Materials," *Annu. Rev. Mater. Sci.* 23, 79 (1993).
201. N. K. Dutta and J. R. Simpson, "Optical Amplifiers" chapter in *Progress in Optics*, 189 (1993).
202. D. T. Nichols, N. K. Dutta, J. Lopata, P. R. Berger, D. Sivco and A. Y. Cho, "Monolithic PIN-FET Photoreceivers," *IEEE Trans. Electron Devices*, 478 (1993).
203. N. K. Dutta, "Radiative Transitions in GaAs and Other III-V Compounds, Chapter in *Semiconductor and Semimetals* 39, 1 (1993).
204. J. Lopata, N. K. Dutta and N. Chand, "  $(\text{InAs})_1/(\text{GaAs})_n$  Superlattice Quantum Well Lasers," *Proceedings of the Materials Research Society Meeting* 281, 287 (1993).
205. N. Chand, N. K. Dutta, J. Lopata and R. Hull, "  $(\text{GaAs})_m(\text{AlAs})_n$  Short-Period Superlattice Quantum-Well Lasers," *J. Appl. Phys.* 73, 1085 (1993).

206. D. Nichols, N. K. Dutta, P. R. Berger, P. R. Smith, D. Sivco and A. Y. Cho, "Monolithic GaAs/AlGaAs pin MESFET Photoreceiver Using a Single Molecular Beam Epitaxy Growth Step," *Electronics Letters* 29, 1133 (1993).
207. N. K. Dutta, J. Lopata, P. R. Berger, S. J. Wang, P. R. Smith and D. L. Sivco, "10 GHz Bandwidth Monolithic p-i-n Modulation-Doped Field Effect Transistor Photoreceiver," *Appl. Phys. Lett.* 63, 2115 (1993).
208. D. T. Nichols, J. Lopata, W. S. Hobson, P. F. Sciortino, Jr. and N. K. Dutta, "DFB and DBR Lasers Emitting at 980 nm," *Electronics Letters* 29, 2035 (1993).
209. N. K. Dutta, "1984 to 1994: An Era of Fiber-Optic Advances," S41 (1994).
210. N. Chand, S. N. G. Chu, N. K. Dutta, J. Lopata, M. Geva, A. V. Syrbu, A. Z. Mereutza and Vladimir P. Yakovlev, "Growth and Fabrication of High-Performance 980-nm Strained InGaAs Quantum-Well Lasers for Erbium-Doped Fiber Amplifiers," *IEEE J. Quantum Electronics* 30, 424 (1994).
211. D. T. Nichols, J. Lopata, W. S. Hobson, N. K. Dutta, P. R. Berger, D. L. Sivco and A. Y. Cho, "Monolithic GaAs/AlGaAs Optical transmitter Circuit Using a Single Growth Step," *Electronics Letters* 30, 490 (1994).
212. D. T. Nichols, N. K. Dutta, P. R. Berger, P. R. Smith, D. Sivco and A. Y. Cho, "Monolithic pin-FET Photoreceivers," *SPIE* 214, 414 (1994).
213. D. T. Nichols, W. S. Hobson, D. Vakhshoori, J. D. Wynn, G. J. Zyzdik, R. A. Morgan, N. K. Dutta, D. L. Sivco, A. Y. Cho and R. E. Leibenguth, "Optical Transmission Systems Employing Vertical Cavity Surface Emitting Lasers and Monolithically Integrated Photoreceivers," *Appl. Phys. Lett.* 65, 3054 (1994).
214. N. K. Dutta, D. Vakhshoori, J. D. Wynn and R. E. Leibenguth, "Continuous Wave Spectral Width of Surface-Emitting Lasers," *J. Appl. Phys.* 77, 1326 (1995).
215. D. T. Nichols, J. Lopata, W. S. Hobson, P. R. Smith and N. K. Dutta, "Monolithic Optical transmitter Circuit Using the InGaP/GaAs Material System," *Appl. Phys. Lett.* 66, 1033 (1995).
216. D. T. Nichols, W. S. Hobson, P. R. Berger, N. K. Dutta, P. R. Smith, J. Lopata, D. L. Sivco and A. Y. Cho, "Monolithically Integrated Optical Receivers and Transmitters," *Inst. Phys. Conf. Ser. No. 141: Chapter 5*, 573 (1995).
217. M. Passlack, C. G. Bethea, W. S. Hobson, J. Lopata, E. F. Schubert, G. J. Zyzdik, D. T. Nichols, J. F. de Jong, U. K. Chakrabarti and N. K. Dutta, "Infrared Microscopy Studies on High-Power InGaAs-GaAs-InGaP Lasers with  $\text{Ga}_{\text{sub }2}\text{O}_{\text{sub }3}$  Facet Coatings," *IEEE Journal of Selected Topics in Quantum Electronics* 1, 110 (1995).
218. Brian J. Markey, Dilip K. Paul, Rajender Razdan, Benjamin A. Pontano and Niloy K. Dutta, "Impedance-Matched Optical Link for C-Band Satellite Applications," *IEEE Transactions on Antennas and Propagation* 43, 960 (1995).
219. N. K. Dutta, D. T. Nichols, D. Vakhshoori, D. L. Sivco and A. Y. Cho, "Digital Transmission Link Using Surface Emitting Lasers and Photoreceivers," *Appl. Phys. Lett.* 67, 588 (1995).
220. N. K. Dutta, "Optical option key to large switching systems "Electronic Engineering Times October 9, 1995
221. N. K. Dutta, "Power penalty due to timing jitter for lasers modulated without prebias " *Appl. Phys. Letts.* 67, 3230, (1995)
222. N. K. Dutta, B. F. Levine, K-Y. Tu, D. Vakhshoori and J. D. Wynn "Receiver and transmitter arrays for optical networks " *SPIE* vol. 2611, 7 (1995)
223. K-Y. Tu, T. J. Gabara, B. F. Levine, J. D. Wynn, N. K. Dutta and K. J. Monteleone "18 channel 622 Mb/s CMOS receiver array for parallel optical interconnects "

224. N. K. Dutta ‘ Optical Interconnection Technology for Large Computing and Switching Systems ‘  
Inst. Phys Ser. No. 145: Chapter 8, 1059 (1996)
225. P. N. Freeman, N. K. Dutta ‘ Intermodulation distortion for a Hybrid AM-VSB/Digital system using  
optical amplifiers ‘ Photonic Tech. Letts.8, 1558(1996)
226. N. K. Dutta, W.S. Hobson, D. Vakhshoori, H. Han, P. N. Freeman, J. F. DeJong, and J. Lopata  
‘ Strain compensated InGaAs-GaAsP-InGaP laser ‘ Photonics Tech. Letts. vol 8, 852 (1996)
227. H. Han, P. N. Freeman, N. K. Dutta, J. Lopata, J. D. Wynn and S. N. G. Chu ‘ High speed  
modulation of strain compensated InGaAs multiquantum well lasers ‘ Photonics Tech. Lett.  
vol 8, 1133 (1996)
228. M. D. Feuer, J. M. Wiesenfeld, J. S. Perino, C. A. Burrus, G. Raybon, S. C. Shunk and  
N. K. Dutta ‘ Single port laser amplifier modulators for optical access ‘ Photonics Tech. Letts.  
vol 8, 1175 (1996)
230. N. K. Dutta, D. T. Nichols, D. C. Jacobson and G. Livescu ‘ Fabrication and performance  
characteristics of high speed ion implanted Si metal-semiconductor-metal photodetectors ‘  
Applied Optics, vol 36, 1180-1184, February 97
231. P. N. Freeman, N. K. Dutta and J. Lopata ‘ Semiconductor optical amplifier for wavelength  
conversion in subcarrier multiplexed systems ‘ Photonics Tech. Letts. vol 9, 46-48 (1997)
232. N. K. Dutta, W. S. Hobson, G. Zydzik, J. F. DeJong, P. Parayanthal, M. Passlack ‘ Mirror  
passivation of InGaAs lasers ‘ Electronics Lett. vol 33, 213-214 (1997)
233. N. K. Dutta, W. S. Hobson, J. Lopata, G. Zydzik ‘ Tunable InGaAs/GaAs/InGaP Laser ‘  
Appl. Phys Lett. Vol 70, 1219-1220, March 1997
234. N. K. Dutta, W. S. Hobson, D. Vakhshoori, J. Lopata and G. Zydzik ‘ Strain compensated  
InGaAs/GaAsP/InGaP Laser ‘ Photonics West, vol 3004, 22-33, 1997
235. N. K. Dutta, K. Y. Tu, B. F. Levine ‘ Optoelectronic integrated receiver ‘ Electronics Lett. Vol  
33, 1254-1256 (1997)
236. N. K. Dutta, K. Y. Tu and B. F. Levine ‘ Receiver array for optical interconnection ‘  
Electronic Letts. Vol 33, 1165, June 1997
237. N. K. Dutta, M. B. Tayahi and K. D. Choquette ‘ Transmission experiments using oxide confined  
vertical cavity surface emitting lasers ‘ Electronics Lett. Vol. 33 , 1254, June 1997
238. M. B. Tayahi, N. K. Dutta, W. S. Hobson ‘ High power InGaAs/GaAsP/InGaP surface emitting  
laser ‘ Electronic Lett. Vol 33, 1794-1795, October 1997
239. H. Fan, M. B. Tayahi , D. W. Young, N. K. Dutta and R. Webster ‘ Analogue and Digital transmission  
through plastic optical fibers ‘ Electronic Letts. Vol 34, 1999 (1998)
240. M. B. Tayahi, H. Fan, B. Whitehouse, N. K. Dutta and R. Webster ‘ 155 Mb/s and 622 Mb/s  
transmission using plastic optical fiber and measurement of modal noise ‘ SPIE vol 3279, p146-153 ,  
1998
241. N. K. Dutta ‘ High speed semiconductor lasers ‘ SPIE, vol 3289, p11-21, 1998

244. N. K. Dutta, M. B. Tayahi, P. N. Freeman and K. D. Choquette " High speed transmission using surface emitting lasers " SPIE vol 3289, p160-164, 1998
245. M. B. Tayahi, H. Fan, R. Webster, N. K. Dutta " Digital and analogue transmission through polymer Optical fiber " SPIE vol.3422, July 1998
246. H. Fan, N. K. Dutta " Mode locked distributed Bragg reflector laser " Electron Letts. vol 35, 48 (1999)
247. H. Fan, C. Wu , N. K. Dutta " Cross gain modulation in semiconductor optical amplifier" SPIE vol 3625, (1999)
248. 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
- 248.C. Wu, H. Fan, N. K. Dutta " Optical demultiplexing using semiconductor amplifiers " SPIE, vol 3847, (1999)
- 249.N. Choudhuri, N. K. Dutta " Linewidth enhancement factor in electroabsorption modulated lasers " SPIE, vol 3847 , p 122 (1999)
250. C. Wu, H. Fan. N. K. Dutta " Optical demultiplexing " SPIE Proceedings, vol 3847, 133-138 (1999)
- .251. N. Choudhury, N. K. Dutta " Electroabsorption modulated lasers " SPIE Proceedings, vol 3847, 197- (1999)
- 252.C. Wu, H. Fan, N. K. Dutta " Rational harmonic mode locked fiber laser" IEEE, JQE, QE- 36, 145 (2000)
- 253.C. Wu, H. Fan, N. K. Dutta " Small signal analysis of four wave mixing in semiconductor optical amplifiers" Journal of Applied Phys., vol 87, 2076(2000)
- 254.N. K. Dutta, C. Wu, H. Fan " Optical demultiplexing using semiconductor amplifiers " SPIE Proceedings, vol. 3945., 204-209 (2000)
- 255.N. Choudhuri, N. K. Dutta " Linewidth enhancement factor and reflection effect in electroabsorption modulated lasers " SPIE Proceedings vol. 3945, 220-230 (2000)
- 256.C. Wu, N. K. Dutta " Stabilization of mode locked erbium doped fiber laser " SPIE Proceedings, vol 3944, 160-166 (2000)
257. N. Choudhury, N. K. Dutta " Modulation doped InGaAsP QW laser emitting at 1.55  $\mu\text{m}$  " SPIE Proceedings, vol 4042, 123-129 (2000)
- 258.H. Fan. C. Wu, N. K. Dutta, A. B. Piccirilli, U. Koren " Mode locked InGaAsP laser " SPIE Proceedings, vol 4042 , 119-122 (2000)
- 259.M. Tayahi, M. El-Aasser, N. K. Dutta "Measurement of transmission characteristics of plastic fibers " SPIE Proceedings, vol 3939, 150-159 (2000)
- 260.H. Fan, C. Wu, M. El-Aasser, N. K. Dutta, U. Koren and A. B. Piccirilli " Colliding Pulse Mode Locked Laser" IEEE, Photonic Tech. Letts. Vol 12, 972-973 (2000)

261. K. Lu, M. B. Tayahi, N. K. Dutta “ Multichannel analog transmission using a 1.3  $\mu\text{m}$  laser and plastic optical fiber” SPIE Proceedings, vol 4216A, 151-157 (2000)
262. N. Choudhury, C. Wu and N. K. Dutta “ Stable optical pulse generation using rational harmonic mode locked fiber laser” SPIE Proceedings, vol 4216A, 192-199 (2000)
263. K. Lu and N. K. Dutta “ Spectroscopic properties of Nd doped glass for 944 nm emission” J. of Appl. Phys., vol. 89, 3079-3083 (2001)
264. N. Choudhury, M. El-Aasser and N. K. Dutta “ 80 Gb/s optical demultiplexing using modulators “ SPIE Proceedings, vol 4285 B, 191-197 (2001)
265. K. Lu and N. K. Dutta “ Modeling of spectroscopic properties of Nd doped glass” SPIE Proceedings, vol 4282, 75-84 (2001)
266. N. Choudhury, A. N. Nikolov, and N. K. Dutta “ Stable high repetition rate pulse generation from a fiber laser” SPIE Proceedings, vol 4285 B, 226-229(2001)
267. K. Lu and N. K. Dutta “Spectroscopic properties of Yb doped glass” SPIE Proceedings, vol 4282, 133-141 (2001)
268. H. Chen, N. Choudhuri and N. K. Dutta “ Measurement and analysis of chirp for four wave mixing” SPIE Proceedings, vol 4386A, 7-12 (2001)
269. K. Lu and N. K. Dutta “ High power laser material for 944 nm emission “SPIE Proceedings, vol 4386A, 14-21 (2001)
270. N. K. Dutta “ High Speed Optical Demultiplexing” SPIE Proceedings, vol 4532 421-428 (2001)
271. N. Choudhuri and N. K. Dutta “ Modulation doped InGaAsP quantum well laser” J. Appl. Phys. Vol 90, 38-42 (2001)
272. G. Zhu, H. Chen and N. K. Dutta “ Time domain analysis of rational harmonic mode locked ring fiber laser” J. Appl. Phys. Vol 90, 2143-2147 (2001)
273. D. Piao, Q. Zhu, N. K. Dutta, S. Yan and L.L. Otis “ Cancellation of coherent artifacts in optical coherence tomography imaging” Appl. Optics , vol 40, 5124-5131 (2001)
274. K. Lu and N. K. Dutta “ Spectroscopic properties of Yb doped fiber glass” J. Appl. Phys. Vol 91, 576-581(2002)
275. N. K. Dutta and N. Choudhuri, Book chapter “ Optical Sources For Telecommunications” in Communications CRC Press Ltd. 2002, pp 46-1, 46-30
276. H. Chen, G. Zhu, N. K. Dutta, R. Fuerst “ High repetition pulse generation using  $\text{LiNbO}_3$  modulators “ SPIE Proceedings, vol 4638, pp 38-48 (2002)
277. G. Zhu, N. K. Dutta “ Linewidth enhancement factor of the electroabsorption modulator “ Micro and Nano-optics, 59-66 (2002)
278. H. Chen, G. Zhu, N. K. Dutta, K. Dreyer “ Suppression of self-pulsing behavior in erbium doped fiber lasers” SPIE Proceedings, vol 4646, 115-123 (2002)
279. H. Chen, G. Zhu, C. Colpitts and N. K. Dutta “ Short pulse generation near 1.55  $\mu\text{m}$  wavelength “ SPIE proceedings, vol 4732 A, 50-59 (2002)
280. G. Zhu, H. Chen, N. K. Dutta “ Rational harmonic mode locked ring fiber laser” , SPIE Proceedings,

vol 4638, 81-87 (2002)

281. P. Dua, K. Lu, N. K. Dutta, J. Jaques “ Analog and digital transmission using high power fiber amplifiers “ SPIE Proceedings, vol 4653, 43-51 (2002)
282. Q. Wang, N. K. Dutta “ Nd doped fiber laser” SPIE Proceedings, vol 4732 A, 7-14 (2002)
283. Q. Wang, N. K. Dutta “ Er-Yb double clad fiber amplifier “ Proceedings ITCOM 2002, p183-190 vol. 4870, 2002
284. P. Dua, Q. Wang, N. K. Dutta “ Measurement of gain tilt and its contribution to CSO in the analog/digital transmission system with Er/YB fiber amplifiers” Proceedings ITCOM 2002, p368-374 vol. 4872, 2002
285. H. Chen, G. Zhu, C. Colpitts, N. K. Dutta “ Tunable short pulse generation “ Proceedings ITCOM , 2002, p161-168, vol. 4870, 2002
286. H. Chen, G. Zhu., Q. Wang, J. Jaques, J. Leuthold, A. B. Piccirilli, N. K. Dutta “ All optical logic XOR “ Proceedings, ITCOM 2002, p137-143, vol. 4870, 2002
287. G. Zhu, H. Chen, N. K. Dutta “ Effect of intracavity dispersion on the properties of detuned mode locked fiber laser” Proceedings ITCOM, 2002
288. M. El-Aasser and N. K. Dutta, “ Analysis and experiment on colliding pulse mode locked laser” Proceedings, ITCOM, 2002, p22-31, vol. 4870, 2002
289. M. El-Aasser and N. K. Dutta, “ Analysis on Design and Optimization of dispersion managed communication systems , Proceedings ITCOM , 2002, p2240235, vol. 4870, 2002
290. D. Q. Piao, L. Otis, N. K. Dutta, Q. Zhu “ Quantitative assessment of flow velocity estimation algorithms for optical Doppler tomography imaging “ Applied Optics. Vol 41, 6118-6127 (2002)
291. L. Otis, D. Q. Piao, Q. Zhu, N. K. Dutta and S. K. Yan “ The effect of source power on image clarity in optical coherence tomography “ Journal of Dental Research, vol 80, 694 (2002)
292. H. Chen, G. Zhu, Q. Wang, J. Jaques, J. Leuthold, N. K. Dutta “All-optical logic XOR using a differential scheme and Mach-Zehnder interferometer” Electronics Letters, 2002, vol. 38, 1271-1272 (2002)
293. H. Chen, G. Zhu, N. K. Dutta, K. Dreyer “ Suppression of self-pulsing behavior in erbium doped fiber lasers” Applied Optics, vol. 41, 3511-3516 (2002)
294. H. Chen, G. Zhu, C. Colpitts, N. K. Dutta “ Short pulse generation “ Proceedings SPIE Aerosense, p38-45, vol. 4732, 2002
295. H. Chen, G. Zhu, N. K. Dutta, K. Dreyer “ Suppression of self-pulsing behavior in erbium doped fiber lasers” Applied Optics, vol. 41, 3511-3516 (2002)
296. Q. Wang and N. K. Dutta, “Er-Yb Doped Double Clad Fiber Amplifier” ITCOM 2003, vol. 5246, 208-215 (2003)
297. N. K. Dutta, N. Choudhuri, G. Zhu, H. Cong “ Modulation doped lasers and modulators “ ITCOM 2003, vol. 5246, 263-275 (2003) – Invited
298. G. Zhu, Q. Wang, H. Chen, N. K. Dutta “ High Speed Clock Recovery With Phase Locked Loop Based On LiNbO<sub>3</sub> Modulators “ ITCOM, 2003, vol. 4247, 261-272 (2003)

299. P. Dua, N. K. Dutta and J. Jaques “ Measurement of gain tilt and its contribution to composite second order distortion in the analog-digital transmission systems with Er/Yb fiber amplifiers” Applied Optics vol. 43, 1747-1751 (2004)
300. Q. Wang and N. K. Dutta “ Spectroscopic properties of Er doped silica glass” J. of Applied Physics, vol. 95, 4025-4028 (2004)
301. G. Zhu, Q. Wang, H. Chen, N. K. Dutta “ High speed clock recovery with phase-locked loop based on LiNbO<sub>3</sub> modulators “ Opt. Engineering vol. 43, 1056-1059, May (2004)
302. Q. Wang, N. K. Dutta “ Er-Yb double-clad fiber amplifier “Opt. Engineering vol. 43, 1030-1034 May (2004)
303. Q. Wang, R. G. Ahrens, N. K. Dutta “ Gain calculation for short Er/Yb doped amplifiers “ SPIE, Proceedings , Photonics West 2004, vol. 5335, 92-101, (2004)
304. Q. Wang, Z. Ghu, H. Dong, N. K. Dutta “ Timing jitter measurement and its reduction in gain switched DFB lasers” SPIE Proceedings, Photonics West 2004, vol. 5349 (2004)
305. G. Zhu, Q. Wang, N. K. Dutta “Simultaneous mode locked operation of a fiber laser at two wavelengths “ SPIE Proceedings, Photonics West 2004, Vol. 5349, 21-29 (2004)
306. G. Zhu, Q. Wang, H. Dong, N. K. Dutta “ High quality optical pulse generation at 80 Gb/s using a modified regenerative type mode-locked fiber laser “ IEEE, JQE,p721-725, vol. 40, June 2004
307. Q. Wang, G. Zhu, H. Chen, J. Jaques, J. Leuthold, A. B. Piccirilli, N. K. Dutta “ Study of All-Optical XOR Using Mach-Zehnder Interferometer And Differential Scheme” IEEE, JQE, p703-710, vol. 40, June 2004
308. G. Zhu, Q. Wang, H. Dong, N. K. Dutta “ Fiber laser relaxation oscillation noise suppression through the use of self-biased intracavity loss modulator “ J. Appl. Phys. Vol. 96, 1790-1793, Aug. 2004
309. G. Zhu, Q. Wang, H. Dong, H. Sun, N. K. Dutta “ 80 Gb/s clock recovery with phase locked loop based on LiNbO<sub>3</sub> modulators “ Optics Express, vol. 12, 3488-3492 (2004)
310. H. Dong, G. Zhu, Q. Wang, H. Sun, N. K. Dutta “ Stabilization of simultaneous mode locked operation at two wavelengths” Optics Express, vol. 12, 4297-4302 (2004)
311. H. Dong, G. Zhu, Q. Wang, H. Sun, N. K. Dutta “Clock recovery using cascaded LiNbO<sub>3</sub> modulators” Optics Express, vol. 12, 4751-4757(2004)
312. H. Dong, Q. Wang, G. Zhu, J. Jaques, A. B. Piccirilli, N. K. Dutta “ Demonstration of all-optical OR gate using semiconductor optical amplifier-delayed interferometer “ Opt. Communication Vol. 242, 479-485 (2004)
313. N. K. Dutta , Q. Wang, G. Zhu, H. Dong, J. Jaques, “Photonic Logic Devices” Proceedings Photonics 2004, Kochi India, December. 2004 ,
314. N. K. Dutta, Q. Wang, G. Zhu, H. Chen, J. Jaques, J. Leuthold “All-Optical XOR Using Mach-Zehnder Interferometer” Proceedings ITCOM, Vol. 5595, 269-276, October 2004
315. G. Zhu, Q. Wang, H. Dong, N.K. Dutta “Fiber Laser Relaxation Oscillation Noise Suppression Through The Use of Self-Biased Intracavity Loss Modulator” Proceedings ITCOM, Vol. 5595, 318-322, October. 2004 ,



316. Q. Wang, R. Ahrens, N. K. Dutta, "Optical Gain of Single Mode Short Er/Yb Doped Fibers" Proceedings ITCOM, Vol. 5595, 447-455, October. 2004 ,
317. H. Dong, G. Zhu, Q. Wang, H. Sun and N. K. Dutta " Multiwavelength fiber ring laser source based on a delayed interferometer " Photonic. Tech. Letts. Vol. 17, 303-305 (2005)
318. H. Sun, Q. Wang, H. Dong and N. K. Dutta "XOR Performance of a Quantum Dot Semiconductor Optical Amplifier Based Mach-Zehnder Interferometer" Optics Express, Vol.13, 1892-1899, March (2005)
319. H. Dong, H. Sun, G. Zhu, Q. Wang, N.K. Dutta, " 160Gb/s OTDM Clock Recovery Using Cascaded LiNbO<sub>3</sub> Modulator "Proceedings Photonics West, 5722-38: 327-334, Jan. 2005
320. Q. Wang, G. Zhu, H. Dong, J. Jaques, J. Leuthold, A. B. Piccirilli, N. K. Dutta "Optical Logic OR gate using a SOA Based Interferometer" Proceedings Photonics West, Jan. 2005
321. N. K. Dutta, Q. Wang, H. Dong, H. Sun, J. Jaques, "Semiconductor optical amplifier based photonic logic devices" Proceedings SPIE Symposium on Photonics Applications, March 2005
322. G. Zhu and N. K. Dutta " Dispersion effects on the detuning properties of actively harmonic mode-locked lasers" Optics Express, Vol. 13, 2688-2698 , April, 2005
323. N. K. Dutta, Q. Wang, G. Zhu, J. Jaques, A. B. Piccirilli, J. Leuthold " Semiconductor optical amplifiers-Functional applications" Journal of Optics, Vol. 33, 197-219 April, 2005
324. H. Dong, Q. Wang, H. Sun and N. K. Dutta " Stable 80 GHz short pulse generation using the cascaded polarization maintaining fiber loop mirrors" Photonics Tech. Letts. Vol. 17, 1396-1398, July 2005
325. 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
326. G. Zhu and N. K. Dutta " Regeneratively stabilized 4<sup>th</sup> order rational harmonic mode-locked erbium doped fiber laser operating at 40 Gb/s" Optics Express, Vol. 13, 3371-3375, May (2005)
327. G. Zhu and N. K. Dutta " 8th order rational harmonic mode-locked fiber laser with amplitude-equalized output operating at 80Gb/s " Optics Letts. Vol. 30, 2212-2214, Sept. (2005)
328. H. Dong , Q. Wang, H. Sun, N. K. Dutta, "Stable 80GHz short pulse generation", Proceedings of the SPIE, (2005); 6014-29.
329. H. Dong, Q. Wang, H. Sun, N. K. Dutta "160Gb/s OTDM clock recovery", Proceedings of the SPIE, (2005);6014-31.
330. N. K. Dutta, J. Jaques " Semiconductor Optical Amplifier Based Optical Logic Devices" Proceedings of the SPIE; 6014-34
331. H. Sun, Q. Wang, H. Dong and N. K. Dutta " All optical logic performance of quantum-dot semiconductor amplifier based devices " Microwave and optical Tech. Letts, Vol. 48, 29-35, Jan. 2006
332. H. Sun, H. Dong, Q. Wang. N. K. Dutta " All optical logic using quantum dot amplifiers" Photonics West, SPIE, Jan. 2006
333. H. Sun, H. Dong, N. K. Dutta "Gain dynamics and saturation property of a semiconductor optical amplifier with a carrier reservoir " IEEE Photonics Tech. Letts. Vol. 18, 196-198, Feb. 2006
334. Q. Wang, H. Dong, H. Sun and N. K. Dutta "All optical logic OR gate using SOA delayed Interferometer " Optics Communications, Vol. 260, 81-86, April 2006

335. G. Zhu, and N.K. Dutta, " Analysis of the residual timing jitter of actively harmonic mode-locked Laser incorporated with high finesse Fabry-Perot filters, JOSAB, Vol. 23,pp.236-240, 2006
336. H. Dong, H. Sun, Q. Wang , N. K. Dutta and J. Jaques. "80Gb/s All-optical Logic AND Operation Using Mach-Zehnder Interferometer with Differential Scheme", Optics Communications, Vol. 265, 79-83, Sept. 2006.
337. H. Dong, H. Sun, Q. Wang , N. K. Dutta and J. Jaques. "All-optical logic AND operation at 80Gb/s using Semiconductor Optical Amplifier based Mach-Zehnder Interferometer" Microwave and Optical Technology Letters, Vol. 48, 1672-1675, Aug. 2006
338. H. Sun, Q. Wang. H. Dong. N. K. Dutta, J. Jaques and A. B. Piccirilli " All optical logic XOR gate using SOA-MZI-DI " IEEE Journal of Quantum Electronics , Vol. 42, 747-781, Aug. 2006
339. H. Sun, H. Dong. N. K. Dutta " Mode locked erbium doped fiber ring laser using intracavity polarization loop mirror " Photonic Tech. Letts. Vol. 18, 1311-1313, June 2006.
340. Z. Chen, H. Sun, S. Ma, N. K. Dutta, "Model Results for Er-Yb double clad fiber amplifiers" Proceedings SPIE, Vol. 6775, Sept. 2007
341. H. Sun, Z. Chen, S. Ma, N. K. Dutta " 80 Gb/s all-optical XNOR using four wave mixing in highly nonlinear fibers" Proceedings SPIE, Vol. 6775, Sept. 2007
342. H. Sun, Z. Chen, S. Ma, N. K. Dutta " All optical logic NOR gate using SOA based Mach-Zehnder interferometer" Proceedings SPIE, Vol. 6775, Sept. 2007
343. M. Rasras, I. Kang, M. Dinu, J. Jaques, N. K. Dutta "A Programmable 8-bit Optical Correlator Filter for Optical Bit Pattern Recognition" IEEE Photonic. Tech. Lett. 694-696, May 1, 2008
344. H. Sun, H. Dong, Z. Chen. N. K. Dutta "80Gb/s All-optical XNOR using a dual Four Wave Mixing Scheme in Highly Nonlinear Fibers" IEEE Photonics Tech. Lett. Submitted
345. N. K. Dutta, J. Jaques and I. Kang "Pseudo Random Word Generation Using Regular and Quantum Dot Semiconductor Amplifier" Milcom, 2008 Proceedings
346. I. Kang, C. Dorrer, .. N. K. Dutta, J. Jaques "Characterization of the Dynamical Processes in All-Optical Signal Processing using Semiconductor Optical Amplifiers" IEEE J. of Selected Topics in Quantum Electronics Vol. 14, 758-769, June 2008
347. Z. Chen, H. Sun, S. Ma, N. K. Dutta " Dual Wave Mode Locked Erbium Doped Fiber Ring Laser" IEEE Photonics Tech. Letts. Vol. 20, 2066-2068, Dec. 2008
348. N. K. Dutta and F. R. Nash " Reliability of Multi-Stripe Laser Arrays" Proc. SPIE, Laser Damage Conference, Vol. 7132, 17 (2008)
349. I. Kang, M. Rasras, M. Dinu, M. Capuzzo, L.T. Gomez, N. K. Dutta, J. Jaques, A. B. Piccirilli "All Optical Byte Pattern Recognition for 40 Gb/s PSK transmission" IEEE Photonics Tech. Letts. Vol. 20, 1024-1026, June 2008
350. Z. Chen, S. Ma, N. K. Dutta " Multiwavelength Fiber Ring Laser Based on a Semiconductor and Fiber Gain Medium" Optics Express, Vol. 17, 1234-1239 (2009)
351. S. Ma, Z. Chen. N. K. Dutta " Small signal analysis of Four Wave Mixing in InAs/GaAs Quantum-Dot Semiconductor Optical Amplifiers" Proc. SPIE, Vol. 7211 10 (2009)

352. S. Ma, Z. Chen, H. Sun, N. K. Dutta “ High Speed all-Optical Logic Gates Based on InAs/GaAs Quantum Dot Semiconductor Optical Amplifiers” Proc. SPIE, Vol. 7211 OP (2009)
353. I. Kang, M. Rasras, L. L. Buhl, M. Dinu, S. Cabot, S. S. Patel, N. K. Dutta, A. Piccirilli, J. Jaques, C. R. Giles “All optical XOR and XNOR at 86.4 Gb/s” Optics Express, Vol. 17, No. 21, 19062-19066 (2009)
354. S. Ma, H. Sun, Z. Chen and N. K. Dutta “High speed all optical PRBS generation using quantum dot semiconductor optical amplifiers” Optics Express, Vol. 17, No. 21, 18469-18477 (2009)
355. S. Ma, Z. Chen and N. K. Dutta “All optical logic gates based on two-photon absorption in semiconductor optical amplifiers” Optics Communications, Vol. 282, 4508-4512, (2010)
356. Z. Chen, S. Ma, N. K. Dutta “Amplitude equalized dual wavelength rational harmonic mode-locked fiber ring laser” Optics Communication, Vol. 283, 1081-1085, (2010)
357. Z. Chen, S. Ma, N. K. Dutta , “An efficient method for supercontinuum generation in dispersion-tailored lead-silicate fiber taper” Optics Communications, Vol. 283, 3076-3080, (2010)
358. S. Ma, H. Sun, Z. Chen and N. K. Dutta “High speed all optical logic gates based on quantum dot semiconductor optical amplifiers” Optics Express, Vol. 18, 6417-6422, (2010)
359. A. Kotb, S. Ma, Z. Chen. N. K. Dutta, G. Said, “High speed all optical gate NAND gate based on two-photon absorption in semiconductor optical amplifiers” Optics Communication, Vol. 283, 4707-4712 (2010)
360. A. Kotb, S. Ma, Z. Chen. N. K. Dutta, G. Said. “Effect of amplified spontaneous emission on Semiconductor optical amplifier based all-optical logic” Optics Communication, Vol.284, 5798-5803 (2011)
361. S. Ma, W. Li, H. Hu, N. K. Dutta “High speed ultrashort-pulse fiber ring laser using photonic crystal fiber nonlinear optical loop mirror” Optics Communication, Vol. 285, 2832-2835( 2012)
362. W. Li, S. Ma, H. Hu and N. K. Dutta “All Optical Latches Using Quantum-Dot Semiconductor Optical Amplifier”, Optics Communications, Vol. 285, 5138-5145 (2012)
363. W. Li, H. Hu and N. K. Dutta “All Optical Latches Based on Two-Photon Absorption in Semiconductor Optical Amplifier”, Journal of Optical Society of America (JOSA-B), Vol. 29 2603-2609 (2012)
364. H. Hu, W. Li and N. K. Dutta “Supercontinuum generation in dispersion tailored lead-silicate fiber taper “ Proc. of SPIE, Photonics West, San Jose, CA, Vol. 8647, Jan. (2013)
365. H. Hu, W. Li and N. K. Dutta “Coherence properties of supercontinuum generated in dispersion tailored microstructured fiber” Fiber and Integrated Optics, Vol. 32, 209-221, May (2013)
366. W. Li, H. Hu and N. K. Dutta “Optical Latches Using Optical Amplifiers”, Proc. SPIE Defense and Security, Baltimore, MD, Vol. 8720, April (2013)
367. H. Hu, W. Li and N. K. Dutta “Wideband coherent supercontinuum generation” Proc. SPIE Defense and Security, Baltimore, MD, Vol. 8733, April (2013)
368. H. Hu, W. Li and N. K. Dutta “Supercontinuum generation in dispersion managed tapered rib waveguide” Applied Optics, 52 (30), 7336-7341 (2013)

369. H. Hu, W. Li, S. Ma, and N. K. Dutta, "Coherence Properties of Supercontinuum Generated in Dispersion-Tailored Lead-Silicate Microstructured Fiber Taper," *Fiber and Integrated Optics*, 32 (3), 209-221 (2013)
370. W. Li, H. Hu and N. K. Dutta "High speed all-optical PRBS generation using binary phase shift keyed signal based on QD-SOA" *Proc. SPIE, Optics and Photonics.*, San Diego, CA August, 17, 2014
371. H. Hu, W. Li and N. K. Dutta "Supercontinuum generation in tapered rib-waveguide" *Proc. SPIE, Optics and Photonics.*, San Diego, CA August, 17, 2014
372. W. Li, H. Hu, X. Zhang and N. K. Dutta " High speed all optical logic gates using binary phase shift keyed signals" , *Int. J. High Speed Electronics and Systems* August (2015)
373. H. Hu, W. Li, X. Zhang and N. K. Dutta "Supercontinuum Generation in Rib Waveguides " ,*Int. J. High Speed Electronics and Systems* Sept. (2015)
374. Hongyu Hu, Wenbo Li, and Niloy K. Dutta, "Dispersion-Engineered Tapered Planar Waveguide for Coherent Supercontinuum Generation," *Optics Communications*, 324, 252-257 (August 2014).
375. Xiang Zhang, Wenbo Li, Hongyu Hu, and Niloy K. Dutta, "High-Speed All-Optical Encryption and Decryption Based on Two-Photon Absorption in Semiconductor Optical Amplifiers," *Journal of Optical Communications and Networking*, 7(4), 276-285 (April 2015).
376. Hongyu Hu, Xiang Zhang, Wenbo Li, and Niloy K. Dutta, "Simulation of octave spanning mid-infrared supercontinuum generation in dispersion-varying planar waveguides," *Applied Optics*, 54(11), 3448-3454 (April 2015).
377. Wenbo Li, Hongyu Hu, and Niloy K. Dutta, "High speed all-optical PRBS generation using QD-SOA," *Proc. SPIE* 9202, 920200 (September, 2014).
378. Hongyu Hu, Wenbo Li, and Niloy K. Dutta, "Supercontinuum generation in tapered Air-SF57 glass-SiO<sub>2</sub> rib waveguide," *Proc. SPIE* 9202, 92021C (September, 2014).
379. Xiang Zhang, Wenbo Li, Hongyu Hu, and Niloy K. Dutta, "High-Repetition-Rate Ultrashort Pulsed Fiber Ring Laser Using Hybrid Mode Locking" *Applied Optics*, 55(28) 7885-7891 (September 2016)
380. Wenbo Li, Hongyu Hu, and Niloy K. Dutta "High-speed ultrashort pulse fiber ring laser using charcoal nanoparticles" *Applied Optics* 55(9) 2149-2154 (July 2016)