Debasis Dawn

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Educational Background:

Degree	Year	University	Field
Doctor of Engineering	1993	Tohoku Univ., Japan	Electrical & Comm. Engg.
Master of Technology	1989	I.I.T Kanpur, India	Electrical Engg.
Bachelor of Engineering	1986	Jadavpur Univ., India	Electrical Engg.

Employment History:

Title	Place	Duties	Duration
Associate Professor	University of Washington, Tacoma	Teaching "Digital Integrated Circuits", "Electrical Circuits II", "Electronics I and II". Research on Radio Frequency Integrated Circuits (RFIC) for radar, sensors communication and biomedical applications.	2018~ present
Associate Professor	North Dakota State University	Teaching "Integrated Circuits", VLSI Designs", "Communication Circuits". Research on Radio Frequency Integrated Circuits (RFIC) for radar, sensors communication and biomedical applications.	2018
Assistant Professor	North Dakota State University	Teaching "Integrated Circuits", VLSI Designs", "Communication Circuits". Research on Radio Frequency Integrated Circuits (RFIC) for radar, sensors communication and biomedical applications.	2012~2018
Research Engineer and Adjunct Professor	Georgia Institute of Technology, Atlanta, GA, USA	Research and development of system-on-chip integrated silicon-based CMOS/SiGe RF front-ends for high data rate (Gb/s) wireless personal area network communication, radar, sensors applications	2006~2012 2011~2014
Adjunct Professor	Southern Polytechnic State University, Marietta, GA, USA	Part-time teaching Electrical Engineering courses: circuit analysis, signals and systems etc..	2011~2012
Sr. MMIC Design Engineer	SONY Corporation, Tokyo, Japan	Development of semiconductor (GaAs, pHEMT) antenna switch ICs for mobile communication applications	2005~2006
Sr. MMIC Design Engineer	Mini Circuits, NY, USA	Design and development of RF front-end MMIC blocks (power amplifier, low-noise amplifier, switch) using GaAs pHEMT process technology	2004~2005
Post Doctoral	Texas A&M University	Research and development of unexploded ordnance (UXO) detection, CMOS RFIC for Ultra-Wide-Band (UWB) communication applications	2003~2004

Research Fellow			
Research Engineer	Fujitsu Ltd., Tokyo, Japan	Design and development of millimeter-wave front-end MMIC blocks (power amplifier, multiplier, mixer) using GaAs pHEMT process technology for 77GHz automotive radar application and development of semiconductor device small/large signal models for implementation in the IC design	1998~2003
Research Associate	Tohoku University, Sendai, Japan	Research and development of microwave/millimeter-wave circuits, antennas, optical modulators for millimeter-wave/optical wave interaction applications	1993~1998

Research Interests:

- System-on-chip (SOC) integrated Silicon-based CMOS/SiGe RF and millimeter-wave front-ends for high data rate (Gb/s) wireless body/personal area network (WBAN, WPAN) communication, high-efficiency/high-linearity power amplifier, digitally controlled transceiver front-end, phased-array multi-beam forming/nulling system, communication radar and sensors for detection applications ranging from disease control, hand-held medical scanners for bio-medical applications to portable weapon scanners for military applications.
- New promising research area of Radio Frequency (RF) Nanotechnology an enabling area bridging the foundations of nanoscience and its wide band radio-frequency applications, through microwaves up to the optical range. Nanoelectronics offers the gateway to a new generation of highly integrated multifunctional devices, circuits and systems.
- Developing integrated circuits and devices beyond millimeter-wave such as sub-millimeter wave and terahertz frequency region which promises a wide range of applications in engineering, science and medicine, such as detecting numerous diseases to inspecting food through its packaging.
- Integrated circuits development in the area of microwave/millimeter-wave and optical wave interactions.

Teaching Experience:

- **Electronics and Analog Circuits II (UWT TEE316):** The purpose of this course is for each student to learn and develop the ability to analyze and design electronic circuits both analog and digital, discrete and integrated. Emphasis is placed on transistor circuit designs. With advances in VLSI technology and the design methodology, IC design itself has become accessible to an increasing number of engineers. Upon successful completion of the course, students should be able to (1) Understand fundamental concepts of Analog-to-Digital and Digital-to-Analog conversion (2) Understand transistor's small-signal modeling and linear amplification (3) Understand various circuit topologies and characteristics of differential amplifiers and operational amplifier design (4) Develop a qualitative understanding of amplifier frequency response.
- **Electronics and Analog Circuits (UWT TCES312):** The purpose of this course is for each student to learn and develop a comprehensive understanding of the basic techniques of modern electronic circuit design, analog and digital, discrete and integrated. Upon

successful completion of the course, students should be able to (1) Understand fundamental concepts of solid-state electronics (2) Understand diode structure, explore various diode models, and applications of diodes in rectifier circuits (3) Develop a qualitative understanding of the operation of the MOS field-effect transistor (4) Develop a qualitative understanding of the operation of the bipolar junction transistor (5) Understand fundamentals of digital electronics and explore the design of MOS logic gates employing either NMOS or PMOS transistors (6) Understand general characteristics and implementation CMOS logic design (7) Develop an understanding of concepts related to linear amplification and circuits containing ideal operational amplifier (op amp).

- **Electrical Circuits II (UWT TEE315):** The purpose of this course is for each student to learn and further explore the techniques of advanced circuit analysis after learning materials in Electrical Circuits I (TCES215). The concepts and analytical techniques gained in this course (e.g., AC analysis, Transformers, Three-Phase Circuits and Transmission lines) will enable students to build an essential foundation towards ascertaining how to build useful electronic circuits and form the basis of many fields within electrical engineering, such as control theory, analog electronic circuits, signal processing. Future EE & CE classes will continue to use the knowledge gained in this class. Upon successful completion of the course, students should be able to (1) Perform power calculations for sinusoidal signals (2) Analyze balanced three-phase circuits (3) Analyze two-port circuits (4) Analyze circuits with magnetically coupled coils, transformers, and transmission lines**.**
- **Wireless IC Design (NDSU ECE722):** Focused on wireless integrated circuit and systems design. Topics covered in the course are basic concepts of wireless communications and modulation schemes, designs of various circuit blocks such as low-noise-amplifier, power-amplifier, mixer, oscillator, receiver and system level design. The objective of this class is to expose the student to the development, application, and analysis of wireless RFIC design.
- **Integrated Circuits (NDSU ECE721):** Purpose of this course is to provide basic foundation and understanding of the analysis and design of analog CMOS integrated circuits, which is in high demand for the students and engineers in today's industry. The objective is to develop both a solid foundation and methods of analyzing circuits by inspection so that the students learn what approximations can be made in which circuits and how much error to expect in each approximation.
- **VLSI Design (NDSU ECE423/623):** Purpose of this course is to provide basic foundation and understanding of the analysis and design of digital integrated circuits, characteristics and applications of logic gates and regenerative logic circuits, which are in high demand for the students and engineers in today's industry. The objective of this course is to (1) introduce transistors and fabrication process (2) introduce basic concepts in CMOS circuit design (3) provide hand-on experience with commercial CAD tool, Cadence (4) address design problems and solutions in VLSI design.
- **Communication Circuits (NDSU ECE421/621):** Purpose of this course is to provide basic foundation and understanding of the analysis and design of Radio Frequency (RF) communication circuits and systems, which are in high demand for the students and engineers in today's industry. RF and wireless market have expanded to an unimaginable

dimension. Cellular phones, cable modems, RF Identification (RFID) tags are rapidly penetrating all aspects of our daily lives. The objective of this course is to provide a systematic treatment of RF electronics with the necessary background knowledge from microwave and communication theory leading to the design of RF transceivers and circuits.

- **Circuit Analysis II (SPSU EE2302):** The purpose of this course is for each student to learn and further explore the techniques of advanced circuit analysis. The concepts and analytical techniques gained in this course (e.g., transformers, Laplace and Fourier transformations, frequency response) will enable students to build an essential foundation towards ascertaining how to build useful electronic circuits and form the basis of many fields within electrical engineering, such as control theory, analog electronic circuits, signal processing. Future EE classes will continue to use the knowledge gained in this class.
- **Signals and Systems (SPSU EE3701):** Purpose of this course is to provide basic foundation and understanding of signals and systems, which is an important discipline of electrical engineering at all stages. A thorough understanding of signals and systems is very essential and after this course students will be ready for proper understanding and application to the other parts of electrical engineering such as signal processing, communication systems and control systems.

Publications:

Refereed Journals

1. S Babak Hamidi, and **Debasis Dawn**, "Fully integrated CMOS tunable power amplifier using reconfigurable input/interstage/output matching networks", *Analog Integrated Circuits and Signal Processing,* vol. 107 issue 1, pp 73-82, Apr. 2021.
2. D. Mitra, S.B. Hamidi, P. Roy, C. Biswas, A. Biswas, and **D. Dawn**, "Radio frequency reliability studies of CMOS RF integrated circuits for ultra-thin flexible packages", *Electronics Letters,* vol. 56 issue 6, pp 280-282, Mar. 2020.
3. P. Roy and **D. Dawn**, "Fully integrated CMOS power amplifier using resistive current combining technique", *IET Microw. Antennas & Propag.,* vol 12, issue 5, pp 826-832, Apr 2018.
4. P. Roy and **D. Dawn**, "A High Power Fully Integrated Single-Chip CMOS Transmitter for Wireless Communication of Unmanned Aircraft System", *Microw. Opt. Technol. Lett., vol.*59, No. 2: 432–439, Feb 2017.
5. D. Mitra, P. Roy and **D. Dawn**, "A Variable Gain CMOS Phase Shifter for Phased Array Antenna Applications", *Microw. Opt. Technol. Lett., vol.* 59, No. 2: 324–328, Feb 2017.
6. P. Roy and **D. Dawn**, "A high-power and high-efficiency CMOS VCO", *Microw. Opt. Technol. Lett.,* 57: 2437–2441, Oct 2015.
7. P. Roy and **D. Dawn**, "High-power and high-efficiency complementary metal–oxide–semiconductor voltage-controlled oscillator for automatic dependent surveillance-broadcast system", *IET Microw. Antennas & Propag.,* Vol 10, Oct 2015.
8. E. Juntunen, **D. Dawn**, J. Laskar, and J. Papapolymerou, "CMOS 45GHz Vector Modulator with Gain/Phase Correction Through Calibration", *Electronics Letters,* vol. 49 issue 4, pp 267-269, Feb. 2013.

9. E. Juntunen, **D. Dawn**, J. Laskar, and J. Papapolymerou, "High-Power, High-Efficiency CMOS Millimeter-Wave Oscillators", *IET Microw. Antennas Propag.,* vol. 6 iss. 10, pp 1158-1163, 2012.
10. E. Juntunen**, Debasis Dawn,** Stephane Pinel, and Joy Laskar, *correction to* "A High-Efficiency, High-Power Millimeter-Wave Oscillator Using A Feedback Class-E Power Amplifier in 45-nm CMOS", *IEEE Microwave and Wireless Components Letters,* vol. 21, no. 10, pp. 574, Oct. 2011.
11. E. Juntunen**, Debasis Dawn,** Stephane Pinel, and Joy Laskar, "A High-Efficiency, High-Power Millimeter-Wave Oscillator Using A Feedback Class-E Power Amplifier in 45-nm CMOS", *IEEE Microwave and Wireless Components Letters,* vol. 21, no. 8, pp. 430-432, Aug. 2011.
12. E. Juntunen, M.C.-H Leung, F. Barale, A. Rachmadugu, D. A. Yeh, B. G. Perumana, P. Sen, **D. Dawn**, S. Sarkar**,** S. Pinel, and J. Laskar, "A 60-GHz 38-pJ/bit 3.5-Gb/s 90-nm CMOS OOK Digital Radio", *IEEE Trans. Microwave Theory Tech.,* vol. 58, No. 2, pp. 348-355, Feb. 2010.
13. **Debasis Dawn**, Padmanava Sen**,** Saikat Sarkar**,** Bevin Perumana, Stephane Pinel, and Joy Laskar, "60-GHz Integrated Transmitter Development in 90-nm CMOS", *IEEE Trans. Microwave Theory Tech.,* vol. 57, No. 10, pp. 2354-2367, Oct. 2009.
14. S. Pinel, P. Sen, S. Sarkar, B. Perumana, **D. Dawn,** D. Yeh, F. Barale, M. Leung, E. Juntunen, P. Vadivelu, K. Chuang, P. Melet, G. Iyer, and J. Laskar, "60GHz Single-Chip CMOS Digital Radios and Phased Array Solutions for Gaming and Connectivity", *IEEE Journal on Selected Areas in Comm.,* vol. 27, No. 8, pp. 1347-1357, Oct. 2009.
15. Padmanava Sen**,** Saikat Sarkar**, Debasis Dawn,** Stephane Pinel, and Joy Laskar, "Integrated VCO with UP/Down Converter for Si-based 60GHz WPAN Applications", *IEEE Microwave and Wireless Components Letters,* vol. 18, No. 2, pp . 139-141, Feb. 2008.
16. Joy Laskar, Stephane Pinel, **Debasis Dawn**, Saikat Sarkar, Bevin Perumana, and Padmanava Sen, "The Next Wireless Wave is a Millimeter Wave", *Microwave Journal*, vol. 50, No. 8, pp. 22-36, Aug. 2007.
17. **Debasis Dawn,** Yoji Ohashi, and Toshihiro Shimura, "A Novel Electromagnetic Bandgap Metal Plate for Parallel Plate Mode Suppression in Shielded Structures", *IEEE Microwave and Wireless Components Letters,* vol. 12, No. 5, pp. 166-168 May 2002.
18. **Debasis Dawn**, "Analysis and Design of a Novel Radial Folded Waveguide Structure for Feeder of a Planar Radial Line Antenna", *International Journal of RF and Microwave Computer-Aided Engineering,* vol. 9 No. 5, pp. 415-423, Sept. 1999.
19. **Debasis Dawn**, "Analysis and Design of Folded Waveguide as Feeder for Planar Radiating Structure", *Journal of Electromagnetic Waves and Applications,* vol. 13, No. 6 pp. 767-780 1999.
20. Tsukasa Yoneyama and **Debasis Dawn**, "Optical Intensity Modulator Using Inverted Slot Line at 60 GHz", "*Optical Quantum Electronics, Chapman & Hall, U. K.", the special issue on "Microwave-Optical Interactions",* vol.30, No. 11-12, pp. 985-993 Dec. 1998.
21. **Debasis Dawn** and Tsukasa Yoneyama, "Periodic Metal Plate Loaded Dielectric Slab Antenna with Broadside Radiation", *IEEE Transactions on Antennas and Propagation,* Vol. 43, No, 10, pp. 1076-1081 Oct.1995.

Refereed Conference Proceedings

22. S. Babak Hamidi, Suman Saripalli and **Debasis Dawn**, "A Fully-Integrated Band-Switchable CMOS Power Amplifier for Wireless Applications", *IEEE Wireless and Microwave Technology Conf. (WAMICON)*, April 2021.
23. **Debasis Dawn**, Jabir Mohammed Patel, Mohammad Wasil Nasry, and S. Babak Hamidi, "A Novel RF Energy Harvester", IEEE MTT-S International Microwave and RF Conference (IMaRC) Dec. 2019.
24. S. Babak Hamidi, and **Debasis Dawn**, "A 900/1900-MHz Band-Switchable CMOS Power Amplifier", IEEE MTT-S International Microwave and RF Conference (IMaRC) Dec. 2019.
25. Arka Biswas, S. Babak Hamidi, Chitralekha Biswas, Palash Roy, Dipankar Mitra and **Debasis Dawn,** "A Novel CMOS RF Energy Harvester for Self-Sustainable Applications", *IEEE Wireless and Microwave Technology Conf. (WAMICON),* April 2018.
26. Palash Roy, S. Babak Hamidi and **Debasis Dawn,** "Fully Integrated LTE-advanced Band-Switchable High-Gain CMOS Power Amplifier", *IEEE International Conf. on Electro/Information Technology (EIT),* May 2017.
27. S. Babak Hamidi and **Debasis Dawn,** "Fully Integrated LTE-Band CMOS Tunable Power Amplifier", *IEEE Wireless and Microwave Technology Conf. (WAMICON),* April 2017.
28. Palash Roy and **Debasis Dawn,** "Single-chip CMOS Transmitter for Automatic Dependent Surveillance-Broadcast (ADS-B) System", *IEEE International Conf. on Electro/Information Technology (EIT),* May 2016.
29. Dipankar Mitra, Palash Roy and **Debasis Dawn,** "A Variable High Gain and High Dynamic Range CMOS Phase Shifter for Phased Array Beamforming Applications", *IEEE International Conf. on Electro/Information Technology (EIT),* May 2016.
30. Dipankar Mitra, Alarka Sanyal, Palash Roy and **Debasis Dawn,** "A Variable Gain CMOS Phase Shifter for Phased Array Beamformer Applications", *3rd International Conference on Foundations and Frontiers in Computer, Communication and Electrical Engineering, ISBN: 978-1-138-02877-7, Jan. 2016*.
31. Palash Roy and **Debasis Dawn,** "A High-Power and High-Efficiency CMOS VCO for Automatic Dependent Surveillance-Broadcast (ADS-B) System", *IEEE International Conf. on Electro/Information Technology (EIT),* May 2015.
32. **Debasis Dawn**, "60GHz CMOS Transmitter Front-end with Built-in Temperature Sensor", *Asia Pacific Microwave Conference (APMC), Sendai, Japan*, Nov. 2014.
33. **Debasis Dawn**, "Millimeter-Wave CMOS Radio Frequency Integrated Circuits Development and its Potential Applications" (Invited), *Asia Pacific Microwave Conference (APMC), Sendai, Japan*, Nov. 2014.
34. **Debasis Dawn** "Millimeter-Wave CMOS Switching Power Amplifiers", *IEEE MTT International Microwave and RF Conference (IMaRC)* Dec. 2013.
35. A. Sanyal, A. Mendoza-Radal, B. Ijaz, and **D. Dawn** "CMOS Phase Shifter for Conformal Phased Array Beamformer Applications", *IEEE International Conference on Wireless for Space and Extreme Environments (WiSEE)* Nov. 2013.
36. B. Ijaz, A. Sanyal, A. Mendoza-Radal, S. Roy, I. Ullah, M. Reich, **D. Dawn,** B. Braaten, N. Chamberlain, and D. E. Anagnostou "Gain Limits of Phase Compensated Conformal

Antenna Arrays on Non-Conducting Spherical Surfaces using the Projection Method", *IEEE International Conference on Wireless for Space and Extreme Environments (WiSEE)* Nov. 2013.

37. C. Patterson, **D. Dawn**, and J. Papapolymerou "A W-Band CMOS PA Encapsulated in an Organic Flip-Chip Package", *IEEE MTT-S Int. Microwave Symp.* Montreal, Canada, June 2012.
38. E. Juntunen, W. Khan, C. Patterson, S. Bhattacharya, **D. Dawn**, J. Laskar and J. Papapolymerou "An LCP Packaged High-Power, High-Efficiency CMOS Millimeter-Wave Oscillator", *IEEE MTT-S Int. Microwave Symp.* Baltimore, MD, June 2011.
39. S. Shin, **D. Dawn**, D. Yeh and J. Laskar "A Model Inaccuracy Aware Design Methodology of Millimeter-wave CMOS Tuned Amplifiers", *Wireless and Microwave Technology Conference (WAMICON), 2011 IEEE 12th Annual, April* 2011.
40. N. Mallavarpu, **D. Dawn,** and J. Laskar "Temperature-Dependent Scalable Large-Signal CMOS Device Model Developed for Millimeter-Wave Power Amplifier Design", *IEEE MTT-S Int. RFIC Symp. Baltimore, MD,* June 2011.
41. V. Sridharan, A. Goyal, S. Sitaraman, N. Kumbhat, N. Sankaran, H. Chan, F. Liu, **D. Dawn,** V. Nair, T. Kamgaing, F. Juskey, V. Sundaram, and R. Tummala "Ultra-miniaturized WLAN RF receiver with chip-last GaAs embedded active", *61st IEEE Electronic Components and Technology Conference (ECTC),* pp. 1371-1376, 2011.
42. J. Laskar, S. Pinel, S. Sarkar, P. Sen, B. Perumana, **D. Dawn**, M. Leung, F. Barale, D. Yeh, J. Shin, S. Hsiao, K. Chuang, E. Juntunen, G. Iyer, A. Muppalla and P. Melet "On the Development of CMOS Sub-THz Phased Array Technology for Communication/Sensing Nodes", *IEEE MTT-S Int. Microwave Symp.* Anaheim, CA, May 2010.
43. **Debasis Dawn,** S. Sarkar, P. Sen, B. Perumana, M. Leung, N. Mallavarpu, S. Pinel, and J. Laskar "60GHz CMOS Power Amplifier with 20-dB-Gain and 12dBm Psat", *IEEE MTT-S Int. Microwave Symp.* Boston, MA, pp. 537-540, Jun. 2009.
44. P. B. Vadivelu, P. Sen, S. Sarkar, **D. Dawn,** S. Pinel, and J. Laskar "Integrated CMOS mm-wave Phase Shifters for Single Chip Portable Radar", *IEEE MTT-S Int. Microwave Symp.* Boston, MA, pp. 565-568, Jun. 2009.
45. Joy Laskar, Stephane Pinel, Saikat Sarkar, Padmanava Sen, Bevin Perumana, M. Leung, **Debasis Dawn,** David Yeh, F. Barale, K. Chuang, G. Iyer, J-H. Lee, and P. Melet, "60GHz CMOS/PCB Co-Design And Phased Array Technology", *IEEE Custom Integrated Circuits Conference (CICC) pp. 453-458,* 2009.
46. Joy Laskar, Stephane Pinel, **Debasis Dawn**, Saikat Sarkar, Padmanava Sen, Bevin Perumana, David Yeh, and F. Barale, "60GHz Entertainment Connectivity Solution", *2009 IEEE International Conference on Ultra-WideBand,* pp. 17-21, Sept. 2009.
47. D. Yeh, A. Chowdhury, R. Pellard, S. Pinel, S. Sarkar, P. Sen, B. Perumana, **D. Dawn,** E. Juntunen, M. Leung, H-C. Chien, Y-T. Hsueh, Z. Jia, J. Laskar and G-K. Chang "Millimeter-wave Multi-gigabit IC Technologies for Super- Broadband Wireless Over Fiber Systems", *Optical Fiber Communication (OFC)*, 2009.
48. N. Mallavarpu, **D. Dawn,** S. Sarkar, P. Sen, S. Pinel, and J. Laskar "Temperature-Dependent Millimeter-Wave Scalable Large-Signal Model for 90nm CMOS", *Asia Pacific Microwave Conference (APMC), Singapore*, pp. 1-4, Dec. 2008.

49. **Debasis Dawn,** Saikat Sarkar, Padmanava Sen, Stephane Pinel, and Joy Laskar "60GHz Silicon-Based Tunable Amplifier", *38th European Microwave Conf. (EuMC),* Amsterdam, The Netherlands, pp. 452-455, Oct. 2008.
50. Joy Laskar, Stephane Pinel, **Debasis Dawn,** Saikat Sarkar, Padmanava Sen, Bevin Perumana, David Yeh, and Francesco Barale "Co-Design of Fully Integrated 60GHz CMOS Digital Radio in QFN Package", *38th European Microwave Conf. (EuMC),* Amsterdam, The Netherlands, pp. 5-8, Oct. 2008.
51. **Debasis Dawn,** S. Sarkar, P. Sen, B. Perumana, D. Yeh, S. Pinel, and J. Laskar "17-dB-Gain CMOS Power Amplifier at 60GHz", *IEEE MTT-S Int. Microwave Symp.* Atlanta, GA, pp. 859-862, Jun. 2008.
52. Saikat Sarkar, Padmanava Sen, Bevin Perumana, David Yeh, **Debasis Dawn**, Stephane Pinel, and Joy Laskar, "60GHz Single-Chip 90nm CMOS Radio with Integrated Signal Processor", *IEEE MTT-S Int. Microwave Symp.* Atlanta, GA, Jun. 2008.
53. Joy Laskar, Stephane Pinel, Saikat Sarkar, Padmanava Sen, Bevin Perumana, David Yeh, F. Barale, and **Debasis Dawn**, "A Transceiver for 60GHz High Data Rate Wireless Transmission", *IEEE MTT-S Int. Microwave Symp. Workshop,* Atlanta, GA, Jun. 2008.
54. Joy Laskar, Stephane Pinel, Saikat Sarkar, Padmanava Sen, Bevin Perumana, **Debasis Dawn,** David Yeh, and F. Barale, "A SOC/SOP Co-design approach for mmW CMOS in QFN Technology", *IEEE Custom Integrated Circuits Conference (CICC) pp. 73-80,* 2008.
55. S. Pinel, S. Sarkar, P. Sen, B. Perumana, D. Yeh, **Debasis Dawn**, and J. Laskar, "A 90nm CMOS 60GHz Radio", *ISSCC Dig. Tech Papers*, pp. 130-131, Feb. 2008.
56. Joy Laskar, Stephane Pinel, **Debasis Dawn**, Saikat Sarkar, Padmanava Sen, Bevin Perumana, and David Yeh, "FR-4 and CMOS: Enabling Technologies for Consumer Volume Millimeter-wave Applications", *Electron Devices Meeting, 2007. IEDM 2007. IEEE International*, pp. 981-984, Dec. 2007.
57. Bevin George Perumana, Anand Raghavan, Sudipto Chakraborty, Chang-Ho Lee, **Debasis Dawn**, Stephane Pinel, and Joy Laskar "A SiGe Sub-harmonic Mixer for Millimeter-Wave Applications", *37th European Microwave Conf. (EuMC),* Munich, Germany, Oct. 2007.
58. **Debasis Dawn,** S. Pinel, S. Sarkar, P. Sen, B. Perumana, D. Yeh and J. Laskar "Development of CMOS Based Circuits for 60GHz WPAN applications", *2007 IEEE International Conference on Ultra-WideBand, Singapore,* pp. 129-133, Sept. 2007.
59. Javier Alvarado Jr., Kevin T. Kornegay, **Debasis Dawn**, Stephane Pinel, and Joy Laskar "60GHz LNA using a Hybrid Transmission Line and Conductive Path to Ground Technique in Silicon", *2007 IEEE RFIC Symp.,* Honolulu, Hawaii, Jun. 2007.
60. **Debasis Dawn,** Yoji Ohashi, and Satoshi Nakamura, "A Novel Planar Transition from Microstrip to Waveguide", *Asia Pacific Microwave Conference (APMC)* Kyoto, Japan, Nov. 2002.
61. **Debasis Dawn,** Yoji Ohashi, and Toshihiro Shimura, "Parallel Plate Mode Suppression in Shielded Structures by Using Electromagnetic Band Gap Metal Plate", *Asia Pacific Microwave Conference (APMC),* Sydney, Australia, pp. 400-403, Dec. 2000.
62. **Debasis Dawn,** Yoji Ohashi, and Toshihiro Shimura, "Probe Pad Structures for Multi Module Scheme at 76 GHz Band", *30th European Microwave Conf. (EuMC),* Paris, France, pp. 361-364, Oct. 2000.

63. T. Taniuchi, N. Mashio, Y. Konno, T. Sato, **D. Dawn**, and T. Yoneyama, "60 GHz Radiation Detection Using Electro-Optic Effect of DAST Crystal", *International Topical Meeting on MICROWAVE PHOTONICSATRI*, Kyoto, Japan, pp. 317-320, Dec. 1996.
64. Tsukasa Yoneyama, **Debasis Dawn**, and Tatsuya Hanasaka, "Optical Intensity Modulator Using Inverted Slot Line at 60 GHz", *International Topical Meeting on MICROWAVE PHOTONICS, ATRI,* Kyoto, Japan, pp. 305-308, Dec. 1996.
65. Tsukasa Yoneyama and **Debasis Dawn**, "Optical Modulator Using Inverted Slot Line at 60 GHz", *Proc. (DC Microwave / Optical Interactions) of U.R.S.I. General Assembly at Lille,* France, Sept. 1996.
66. **Debasis Dawn** and Tsukasa Yoneyama, "Optical Intensity Modulator Using Inverted Slot Line at 60 GHz", *Proceedings of 1996 China-Japan Joint Meeting on Microwaves*, Hefei, P. R. China, pp. 48-51, Apr. 1996.
67. **Debasis Dawn** and Tsukasa Yoneyama, "A Periodic Metal Plate Loaded Dielectric Slab Antenna", *4th International Symposium on Recent Advances in Microwave Technology (ISRAMT '93),* New Delhi /Agra, India, Dec. 1993.
68. **Debasis Dawn** and M. Sachidananda, "Analysis and Design of Strip Line to NRD Guide Transition", *The 3rd Asia-Pacific Microwave Conference (APMC '90*), pp. 15-18, Tokyo, Japan, Sept. 1990.

Invited Talks

1. **Debasis Dawn** "Siliconization of Radio Frequency Integrated Circuits (RFIC): The possibilities are infinite...", *2020 IEEE Radio and Wireless Week (RWW), San Antonio, TX*, Jan. 2020.
2. **Debasis Dawn** "Millimeter-Wave CMOS Radio Frequency Integrated Circuits Development and its Potential Applications", *Asia Pacific Microwave Conference (APMC), Sendai, Japan*, Nov. 2014.
3. **Debasis Dawn** "Silicon Microelectronic Circuits: Radio Frequency and Beyond", *UGC Sponsored Refresher Course "Nano devices and low-power VLSI Design", Jadavpur University,* India, Dec. 2013.
4. **Debasis Dawn** "CMOS Integrated Beam Former with Conformal Phased Array Antenna for Wireless Communications", *NASA Jet Propulsion Laboratory (JPL),* Pasadena, CA, USA, Jun. 2013.
5. **Debasis Dawn** "Millimeter-Wave CMOS Integrated Circuits Development and its Potential Applications", *National Institute of Information and Communications Technology (NICT),* Tokyo, Japan, May 2012.
6. **Debasis Dawn** "Layout and Temperature Dependent CMOS Device Models and their Application for Millimeter-Wave Transmitter Design", *Agilent Goldengate Users Networking Event during IEEE RFIC Symposium,* Anaheim, CA, May 2010.
7. **Debasis Dawn** "Development of 60GHz Radio in CMOS", *IEEJ Research Committee on Millimeter-Wave Engineering and Science, The Institute of Electrical Engineering of Japan,* Hyogo, Japan, June 2009.

8. **Debasis Dawn,** S. Pinel, S. Sarkar, P. Sen, B. Perumana, D. Yeh and J. Laskar "Development of CMOS Based Circuits for 60GHz WPAN applications", *2007 IEEE International Conference on Ultra-WideBand, Singapore,* pp. 129-133*,* Sept. 2007.

Book Chapter

1. **Debasis Dawn**, "RF and mm-Wave Power Generation in Silicon" Chapter 10: 60GHz All-Silicon Radio IC: How It All Started, Elsevier, ISBN: 978-0-12-408052-2, Dec 2015.

Patents:

1. **Debasis Dawn,** and Babak Hamidi, "Bit Optimized Reconfigurable Network (BORN) for Band-Switchable Active Circuits" United States of America Provisional Patent Number: **63/170,767 April 5, 2021.**
2. **Debasis Dawn,** Yoji Ohashi, and Toshihiro Shimura, "Millimeter Wave Module having Probe Pad Structure and Millimeter Wave System using Plurality of Millimeter Wave Modules" United States of America Patent Number: **US 6,867,661 B2 March 15, 2005.**
3. **Debasis Dawn,** Yoji Ohashi and Edmar Camargo, "Transmission Line to Waveguide Transition Including Antenna Patch and Ground Ring", United States of America Patent Number: **US 6,822,528 B2 Nov. 23, 2004.**
4. **Debasis Dawn,** Yoji Ohashi, and Toshihiro Shimura, "Metal Plate with Three Dimensional Photonic Band Gap Structures for Parallel Plate Mode Suppressor", submitted to Japanese patent office for international patents, No. 99-51703.

Awards:

- Awarded **National Merit Scholarship Award** by the Board of Secondary Education, Government of West Bengal, India, 1980.
- Awarded **Japanese Government Scholarship Monbusho** by the Ministry of Education, Japan, 1989~1993.
- **Excellent invention award** by **Fujitsu Laboratories Ltd.** for patent "Metal Plate with Three Dimensional Photonic Band Gap Structures for Parallel Plate Mode Suppressor", (PCT/JP/00/01357), Dec. 20, 2000.

Project Leadership and Supervision:

A. Individual Student Guidance/Development

1. PhD Students Supervised (Graduated): 2

   Name: Palash Roy
   Title: *High-Power High-Efficiency Multi-Functional CMOS Radio Frequency Integrated Circuit (RFIC) for Wireless Communication of Unmanned Aircraft System (UAS)*
   Graduation: Dec. 2017.

Name: Seyyed Babak Hamidi Perchehkolaei
Title: *Bit Optimized Reconfigurable Network (BORN): A New Pathway Towards Implementing a Fully Integrated Band-Switchable CMOS Power Amplifier*
Graduation: Jul. 2020.

2. PhD Students Supervised (Co-Advisor) (Graduated): 2

Name: Eric Juntunen
Title: *Low Power, High-Efficiency and High-Linearity CMOS Millimeter-Wave Circuits and Transceivers for Wireless Communications.*
Graduation: April 2012.

Name: Navin Mallavarpu
Title: *Large-Signal Model Development and High Efficiency Power Amplifier Design in CMOS Technology for Millimeter-Wave Applications.*
Graduation: April 2012.

3. MS Students Supervised (graduated): 3

Name: Alarka Sanyal
Title: *CMOS Phase Shifter for Conformal Phased Array Beamformer Applications*
Graduation: Apr. 2015.

Name: Dipankar Mitra
Title: *A Variable High Gain and High Dynamic Range CMOS Phase Shifter for Phased Array Antenna Applications*
Graduation: Dec. 2016.

Name: Sayantica Pattanaik
Title: *Encoding Efficient Attributes Using Chinese Remainder Theorem for Anonymous Credentials*
Graduation: Jan. 2015.

B. Research Program Development

Program: Established a collaborative research and development effort with **Fujitsu Laboratories Ltd., Japan** in the area of "New wireless communication schemes and circuits applicable to the millimeter-wave frequency bands"
Duration: Oct'09 ~ Oct.'10; one year
Funds: $65K
Supervision: Supervised one visiting research scholar in developing "Millimeter-Wave High-Efficiency High-Linearity Transmitter at 94GHz-band"

C. Research Proposals and Funding

(a) Title: "Chip-based ADS-B for High Density, Low Altitude UAV Operations", NASA SBIR Phase-II with Industry Partner KalScott Engineering Inc.
Funding: $289,961 (PI); Duration: Aug.'20~Jul.'22

(b) Title: "Chip-based ADS-B for High Density, Low Altitude UAV Operations", NASA SBIR Phase-I with Industry Partner KalScott Engineering Inc.
Funding: $40,000 (PI); Duration: Aug.'19~Feb.'20

(c) Title: "Reliability Studies of CMOS Radio Frequency Integrated Circuits (RFIC) for Ultra-Thin Flexible Packages", NextFlex/Uniqarta Inc.
Funding: $36,294 (PI); Duration: May'17~Dec.'17

(d) Title: "II-NEW: Probe Station to Characterize Body Area Network Sensor ICs for Cyber Physical Systems Applications", NSF (award 1628961)
Funding: $362,865 (PI); Duration: Aug.'16~Jul.'19

(e) Title: "Tunable Power Amplifier for Smart Phones", North Dakota Department of Commerce, Venture Grant Phase-I.
Funding: $100,000 (PI); Duration: Jan.'16~Dec.'17

(f) Title: "CMOS RFIC Development for Automatic Dependent Surveillance-Broadcast (ADS-B) Systems", Center of Research Excellence (CORE) of North Dakota, Limited Deployment Cooperative Airspace Project: NDSU ADS-B Miniaturization Program.
Funding: $94,544 (PI) Duration: Apr.'13~Dec.'15

(g) Title: "CMOS Integrated Beam Former with Conformal Phased Array Antenna for Wireless Communications", for ND NASA EPSCoR
Funding: $32,400 (PI) Duration: Nov.'12~Dec.'13

(h) Title: **"**Multi-beam Beam Forming/Nulling Analog Pre-processor and Millimeter-Wave Highly Efficient Linearized Transmitter", for DARPA LEAP Funding: Free tape-out opportunity in IBM 45nm SOI CMOS; equivalent to about $100K (Co-PI)

(i) Title: "Ultra-compact ultra-low power wireless radio node for Body/Personal Area Networks", for DARPA/STO
Funding: $250K (Co-PI)

(j) Title: "Broadband High Frequency Measurement Set-up, Design-kit Development for RFIC Design and Radio Architecture Planning", for Samsung Electro Mechanics
Funding: $30K (PI)

(k) Title: "Development of Efficient Highly Linear Transmitters for LTE Mobile Applications" for Pixel Sand
Funding: $150K (Co-PI)

Professional Service:

A. **Editorial Board Member** of *IEEE Microwave Theory and Techniques Society (IEEE MTT-S)*.

B. **Symposium Session Chair/Co-Chair: "**Power Amplifier Design Techniques for Millimeter-Wave and Multi-band Applications", *IEEE MTT-S Int. Microwave Sym. (IMS), Since June 2008*.

C. **Technical Program Review Committee Member:** "Power-Amplifier Devices and Integrated Circuits", *IEEE MTT-S Int. Microwave Sym. (IMS),* Since June 2008.

D. **Steering Committee Member:** "Workshops and Tutorials", *IEEE MTT-S Int. Microwave Sym. (IMS),* Atlanta, GA, Jun. 2008.

E. **NSF Panelist:** Computer & Information Science & Engineering (CISE) and Electrical, Communications and Cyber Systems (ECCS), Since 2017.

F. **Journal/Symposium Reviewer:**
- *IEEE Trans. Microwave Theory Tech.,* Since 2009.
- *IEEE Microwave and Wireless Components Letters,* Since 2012.
- *IEEE MTT-S Int. Microwave Symp.* Since 2008.
- *IEEE Transactions on Very Large Scale Integration Systems,* Since 2016.
- *IEEE Transactions on Circuits and Systems II,* Since 2016.
- *Radio Science*
- *Electronics Letter*
- *The Institute of Electronics, Information and Communication Engineers (IEICE) Trans.*

Professional Membership:

- *The Institute of Electrical and Electronics Engineers (IEEE): Senior Member*

Language Proficiency:

- **Bengali** native level.
- **Hindi** native level.
- **English** native level. (**TOEIC: 885)**
- **Japanese** speaking, reading native level.
- **French** certificate level.