

Dr. KAJAL MONDAL

Academic Curriculum Vitae

Assistant Professor
Department of Physics
Vivekananda Mahavidyalaya, Burdwan
Burdwan 713103, West Bengal, India
Email: kajal86.kgp@gmail.com



Research Area:

Optics & Photonics

Research Abstract:

Broad area of my research is Optics & Photonics, which particularly deals light propagation in microstructure holey optical fibers (also called photonic crystal fiber or PCF in short) and designing new fibers and in-line active/passive fiber devices. My study includes basic modeling, designing, and realization of various fiber-optic application issues associated with the network, laser, amplifier, sensor etc. In my research on designing and analyzing optical fiber waveguides for device applications, I worked out on FD methods/algorithms aimed at precise and fast characterizing these complex structures.

My experimental research deals with the realization of fiber-optic sensor for measurement of different physical parameter, *e.g.* temperature, pressure, stress, magnetic field etc.

My immediate future plan of research is to carry out theoretical and experimental studies towards realizing new photonic devices/ structures.

Education:

- PhD, (2014) Physics, Indian Institute of Technology, Kharagpur, India,
Supervisor: Dr. Partha Roy Chaudhuri
Thesis title: Light propagation in microstructured holey optical fibers and designing new fibers and in-line active fiber devices
- M.Sc. (2008) in Physics, Indian Institute of Technology, Kharagpur, India
Project title: X-ray reflectivity technique and its simulation for various cases
Supervisor: Dr. Sanjeev Kumar Srivastava
- B. Sc. (2006) in Physics (Honours), Burdwan University, West Bengal, India

Post Doctoral Experience:

- 06/01/2014 to 16/09/2014, Department of Physics, IIT, Kharagpur, India
Project: Sensing/detection of feeble magnetic field with optical fiber with ceramic magnetostrictive jackets
PI: Dr. Partha Roy Chaudhuri
- 17/09/2014 to 23/03/2015, Department of Civil Engineering, IIT Kharagpur, India
Project: Real time detection of face/core debond initiation and interfacial delamination propagation morphology in sandwich composite panels using fiber-optic Bragg grating sensors
PI: Dr. Nilanjan Mitra

Teaching Experience:

01/04/2015 to Till date, Assistant Professor in the Department of Physics, Vivekananda Mahavidyalaya, Burdwan, West Bengal.

Courses Currently Teaching:

I generally teach Electrostatics, Electro-Magnetic Theory, Ray Optics, Wave Optics, General Properties of Matter, and Nuclear Physics as per requirement of the UG Physics (Honors and General) students.

Computational Skill:

- **Software:** Mathematica, Mathtype, Parrott 32
- **Language:** C Language, Matlab, Scilab.
- **Numerical technique:** FD, FDTD, PWE

All India Exams Qualified:

- Joint Admission Test to M. Sc. (**JAM**) 2006
- Graduate Aptitude Test for Engineers (**GATE**) 2008
- National Eligibility Test (**NET**) Dec.2008

Publications:

Book-chapter

1. Partha Roy Chaudhuri and **Kajal Mondal**, Chapter 7, Advances in Optical Science and Engineering, Edited by V. Lakshminarayanan and I. Bhattacharya, (Springer in Physics 166, 2015) [ISBN: 978-81-322-2367-2] Jun 2015.
DOI: https://doi.org/10.1007/978-81-322-2367-2_7.

International journals

1. Sourabh Roy, **Kajal Mondal**, and Partha Roy Chaudhuri, “Modeling the tapering effects of fabricated photonic crystal fibers and tailoring birefringence, dispersion and supercontinuum generation properties,” Applied Optics, vol. 48, No. 31, pp. G106–G113, Nov. 2009.
2. **Kajal Mondal** and Partha Roy Chaudhuri, “Er⁺³-doped fiber amplifier in triangular PCF host revisited: higher gain, low splice loss,” Proceedings of SPIE, vol. 8173, pp. 81730V1–81730V9, Aug. 2011.
3. **Kajal Mondal** and Partha Roy Chaudhuri, “Designing high performance Er⁺³-doped fiber amplifier in triangular-lattice photonic crystal fiber host towards higher gain, low splice loss,” Optics and Laser Technology, vol. 43, No. 8, pp. 1436–1441, Nov. 2011.
4. **Kajal Mondal** and Partha Roy Chaudhuri, “Designing ultra-high-birefringent photonic crystal fibers with circular air holes in the cladding” Fiber and Integrated Optics, vol. 32, No. 1, pp. 54–69, Feb. 2013.
5. Saba N. Khan, Sudip Chatterjee, **Kajal Mondal** and Partha Roy Chaudhuri, “Characteristics of transverse-stress induced phase change through a distinct dual-mode fiber in Sagnac loop” JOSA A, vol. 30, pp. 1013–1020, May 2013.
6. **Kajal Mondal** and Partha Roy Chaudhuri, “Investigation of structural dependence of host erbium-doped triangular-lattice PCF on lasing properties and designing high performance laser” Journal of Modern Optics, vol. 60, No. 15, pp. 1247–1252, Sep. 2013.
7. **Kajal Mondal** and Partha Roy Chaudhuri, “Designing high-performance fiber laser based on ring structured PCF host” Journal of Optics, vol. 45, No. 1, pp. 39–43, Jan. 2016.
8. **Kajal Mondal** and Partha Roy Chaudhuri, “Dispersion tailoring in circular photonic crystal fibers for ultraflattened dispersion” IEEE Photonics Technology Letters, vol. 30, No. 10, pp. 951–954, May. 2018.
9. **Kajal Mondal**, “A comparative study of birefringence in photonic crystal fiber employing various lattice geometries with all circular air holes” Optik - International Journal for Light and Electron Optics, vol. 215, No. 164699, pp. 1–7, Apr. 2020.

10. **Kajal Mondal**, “Structural dependence of transmission characteristics for photonic crystal fiber with circularly distributed air-holes” *Journal of Optical Communications*, vol. 41, No. 000010151520200032, pp. 1–7, Jun. 2020.

International conferences

1. Sourabh Roy, **Kajal Mondal** and Partha Roy Chaudhuri, “Effect of tapering realistic photonic crystal fiber in tailoring birefringence and dispersion properties,” International conference *Optics & Photonics 2009*, October 30–November 1, CSIO Chandigarh, India.
2. Sourabh Roy, **Kajal Mondal**, Sudip Kr. Chatterjee and Partha Roy Chaudhuri, “Design, in-house fabrication and analysis of suspended core silica-strand photonic crystal fiber,” International conference *ELECTRO 2009*, December 22-24, IT BHU, India.
3. **Kajal Mondal**, Sourabh Roy and Partha Roy Chaudhuri, “Er⁺³-doped fiber amplifier in triangular PCF host revisited: higher gain, low splice loss,” International conference *Photonics 2010*, December 11–15, IIT Guwahati, India.
4. Sourabh Roy, Sudip Kr. Chatterjee, **Kajal Mondal** and Partha Roy Chaudhuri, “Effect of liquid concentration on modal propagation in large air-cladding microstructured fiber fabricated in-house,” International conference *Photonics 2010* December 11-15, IIT Guwahati, India.
5. **Kajal Mondal** and Partha Roy Chaudhuri, “Ultra high birefringent photonic crystal fiber with circular air-holes,” International conference *ICTAP 2011*, December 1-2, IIT Kharagpur, India.
6. **Kajal Mondal**, Partha S. Maji, Sudip Kr. Chatterjee, Saba N. Khan and Partha Roy Chaudhuri, “Designing high-performance fiber laser with triangular-lattice photonic crystal fiber,” International conference *Photonics 2012*, Dec. 9-13, 2012, IIT Madras, India.
7. Sudip Kr. Chatterjee, **Kajal Mondal**, Saba N. Khan and Partha Roy Chaudhuri, “Exact mode field solutions and dispersion characteristics of N-layered high-index core Bragg fiber,” International conference *Photonics 2012*, Dec. 9-13, 2012, IIT Madras, India.
8. Saba N. Khan, **Kajal Mondal**, Sudip Kr. Chatterjee and Partha Roy Chaudhuri, “Transverse stress induced phase deviation measurement using Sagnac loop with a distinct dual mode fiber segment,” International conference *Photonics 2012*, Dec. 9-13, IIT Madras, India.
9. **Kajal Mondal**, and Partha Roy Chaudhuri, “Performances of ring-shaped cladding structured PCF laser and triangular lattice PCF laser,” Workshop on recent advances in photonics (WRAP) 2013, Dec. 17-18, 2013, IIT Delhi, India.
10. **Kajal Mondal**, and Partha Roy Chaudhuri, “Ring-structured PCF: achieving high gain EDFA over short length,” International conference on optics and optoelectronics (ICOL) 2014, Mar. 05-08, 2014, IRDE, Dehradun, India.

11. Somarpita Pradhan, **Kajal Mondal**, and Partha Roy Chaudhuri, “Response of nano crystalline cobalt-doped nickel ferrite particles in magnetic field detection experiments,” JSAP-OSA Joint Symposia 2014, Sep. 17-20, 2014, Sapporo, Hokkaido, Japan.
12. Sudip Chatterjee, Saba Khan, **Kajal Mondal** and Partha Roy Chaudhuri, “Binary multi-clad microstructured fiber with all-normal dispersion for two-octave spanning flat-top coherent supercontinuum generation,” International conference Photonics 2014, Dec.13-16, 2014, IIT Kharagpur, India.
13. Saba Khan, Sudip Chatterjee, **Kajal Mondal** and Partha Roy Chaudhuri, “Switchable Hermite Gaussian beam generation in dual-mode fiber by controlling incident polarization,” International conference Photonics 2014, Dec.13-16, 2014, IIT Kharagpur, India.
14. **Kajal Mondal** and Partha Roy Chaudhuri, “A new design of highly birefringent photonic crystal fiber using three different axial asymmetries” International Science Seminar ISS 2017, Oct. 10, 2017, Burdwan Raj College, India.

National conferences

1. **Kajal Mondal**, “Analysis of erbium doped fiber amplifier using circular-lattice photonic crystal fiber,” National conference NCFMSP 2020, March 5-6, 2020, SKBU Purulia, India.

Conferences/ Symposium/ Workshop/Webinar Attended:

- Theme Meeting on Ultrafast Science (UFS) 2013, Organized by the Department of Physics, IIT Kharagpur and Indian Society for Radiation and Photochemical Sciences Mumbai (ISRAPS), 25th – 26th October, 2013.
- International OSA Network of Students (IONS) Asia-6, Organized by the Department of Physics, IIT Kharagpur, 10th – 12th December, 2014
- Workshop on SCILAB, Organized by the Department of Physics, Burdwan University, 17th – 18th August, 2018.
- Workshop on “Some advanced topics in undergraduate studies under CBCS system”, Organized by the Department of Physics, Burdwan University, 6th – 7th September, 2019.
- Webinar on “Impact of Covid-19 on higher education & a quest for possible alternatives,” Organized by Sukanta Mahavidyalaya, Jalpaiguri, West Bengal, 22nd –24th June, 2020.
- Webinar (Lecture Series) on “Quantum World: past, present & future,” Organized by Department of Physics, Prabhat Kumar College, West Bengal, 3rd –11th July, 2020.
- Webinar on “World in the nano regime,” Organized by Department of Physics and Chemistry, Bankura Zilla Saradamani Mahila Mahavidyapith, West Bengal, 18th July, 2020.

Faculty Development Courses or Programmes Attended:

- **Orientation Program:**

Sponsoring agency: UGC

Institute: Academic Staff College, Burdwan University

Duration: 01/08/2017 to 28/08/2017

- **Refresher Course:**

Sponsoring agency: UGC

Institute: Academic Staff College, Burdwan University

Duration: 14/09/2018 to 04/10/2018

Reviewer of Journal:

- Optical Engineering (SPIE)
- Optik - International Journal for Light and Electron Optics (ELSEVIER)