RANJAN KALITA, PHD

CONTACT INFORMATION

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PERSONAL INFORMATION

Gender:	Male	*Father's Name*:	Baneswar Kalita
Nationality:	Indian	*Mother's Name*:	Sashi Kalita
Date of Birth:	14 April, 1987	*Spouse Name*:	Tarangini Sonowal Kalita

EDUCATION

Academic Program	Institute/ University/ Board	Year of passing	Division secured	% of Marks/ CGPA
High School Leaving Certificate Exam.	SEBA	2003	First	72.33
Higher Secondary Examination	AHSEC	2005	First	74.40
BA/BSc/Bcom (BSc in Physics)	Cotton College	2008	First (D)	68.50
MA/MSc/MCom (MSc in Physics)	Gauhati University	2010	–	8.96 CGPA
PhD	IIT Guwahati	June 2020	–	–

NET/GATE/ SLET:

◇ SLET-NE in Physical Science (2021)
◇ GATE in Physics (2015, 2016)

RESEARCH EXPERIENCE

Post Doctoral Research

[1] Project Fellow, **IIT Guwahati** 08/2021 - 10/2021
◇ Topic: **Implementation of state of the art imaging systems.**
◇ Supervisor: Prof. Bosanta R Boruah

[2] Consultancy service to **Imperial College London** 04/2021 - 07/2021
◇ Topic: Provide scientific support to the collaborative project "openScopes for histopathology", including the assembly of openScopes instruments in IIT Guwahati and the further collaborative development of these instruments.
◇ Supervisor: Prof. Paul French, Prof. Bosanta R Boruah

[3] Sponsored Researcher, **Imperial College London** 08/2020 - 02/2021
Research Assistant, **Imperial College London** 02/2020 - 07/2021
◇ Topic: **Development of an open source microscopy platform for histopathology including super-resolved microscopy and hyperspectral imaging for diagnosis of infectious disease, cancer and kidney disease.**
◇ Supervisor: Prof. Paul French

As an Doctoral Researcher

◇ *Department of Physics*, **IIT Guwahati** 2014 - 2020
◇ Thesis title: **Development of a laser scanning confocal microscope with programmably switchable vector beam illuminations.**
◇ Supervisor: Prof. Bosanta R Boruah

Post MSc Research

[1] *Junior Research Fellow*, 2012 - 2013
North Eastern Space Applications Center,
◇ Topic: **Development of effective classification scheme for hyperspectral satellite data.**
◇ Supervisor: Dr. Dibyajyoti Chutia

[2] *Junior Research Fellow*, 2011 - 2012
Institute of Advanced Study in Science and Technology,
◇ Topic: **Study of strongly coupled dusty plasma produced in a RF discharge.**
◇ Supervisor: Prof. Heremba Bailung

PUBLICATIONS

◇ Patent (Indian)

[1] *A system and method for laser beam scanning with periodic switching of polarization of the beam*. **Ranjan Kalita**, S. S. Goutam Buddha, Bosanta R. Boruah, *Indian Patent Application No.:* **201831006652** dated 21 Feb 2018, *Patent No.:* **377789** grant dated 24 Sept 2021.

◇ Journal

[1] **Ranjan Kalita**, William Flanagan, Jonathan Lightley, Sunil Kumar, ···, and Paul M. W. French, Single-shot phase contrast microscopy using polarisation-resolved differential phase contrast. *Journal of Biophotonics*, **14** (12), e202100144 (2021).

[2] Jonathan Lightley, Frederik Görlitz, Sunil Kumar, **Ranjan Kalita**, ···, and Paul M. W. French, Robust optical autofocus system utilizing neural networks trained for extended range and time-coarse and automated multiwell plate imaging including single molecule localization microscopy. *Journal of Microscopy*, **online version after accepted for publication**, (2021).

[3] Edwin Garcia, Jonathan Lightley, Sunil Kumar, **Ranjan Kalita**, ···, and Paul M. W. French, Application of direct stochastic optical reconstruction microscopy (dSTORM) to the histological analysis of human glomerular disease. *The Journal of Pathology: Clinical Research*, **7** (5), 438-445 (2021).

[4] S. S. Goutam Buddha, **Ranjan Kalita**, and Bosanta R. Boruah, Array detection in a holographic scanning microscope. *Optics Communications*, **462**, 125339 (2020).

[5] **Ranjan Kalita**, Anindita Saikia, Atool Ch. Bhuyan, and Bosanta R. Boruah, Holographic scanning confocal microscopy for both reflected light and fluorescence light imaging. *Review of Scientific Instruments*, **90** (10), 106103 (2019).

[6] **Ranjan Kalita**, S. S. Goutam Buddha, and Bosanta R. Boruah, A laser scanning microscope executing intraframe polarization switching of the illumination beam. *Review of Scientific Instruments*, **89** (9), 093705 (2018).

[7] Md. Gaffar, **Ranjan Kalita**, and Bosanta R. Boruah, Experimental observation of the aberration effects on a radially polarized beam. *JOSA-A*, **33** (11), 2178-2187 (2016).

[8] Md. Gaffar, **Ranjan Kalita**, and Bosanta R. Boruah, Experimental demonstration of a light beam with superior aberration resilience. *Optics Letters*, **41** (19), 4425-4428 (2016).

[9] **Ranjan Kalita**, Md. Gaffar, and Bosanta R. Boruah, Generation of arbitrary vector beams using a division of wavefront based setup. *Journal of Optics (IOP)*, **18** (7), 075604 (2016).

[10] D. Chutia, D. K. Bhattacharyya, K. K. Sarma, **Ranjan Kalita**, and S. Sudhakar, Hyperspectral Remote Sensing Classifications: A Perspective Survey. *Transactions in GIS*, **20** (4), 463-490 (2016).

[11] S. K. Sharma, **Ranjan Kalita**, Y. K. Nakamura, and H. Bailung, Dust charge measurement in a strongly coupled dusty plasma produced by an rf discharge. *Plasma Sources Science and Technology*, **21** (4), 045002 (2012).

◇ Conference Proceedings

[1] **Ranjan Kalita**, Jonathan Lightley, Sunil Kumar, Y Alexandrov, ... , and Paul MW French, Single-shot quantitative phase contrast polarisation-resolved differential phase microscopy. *In European Conferences on Biomedical Optics 2021 (ECBO), ETu3B.2, Optical Society of America,* (2021).

[2] Jonathan Lightley, Frederik Görlitz, Sunil Kumar, **Ranjan Kalita**, ..., and Paul MW French, Robust optical autofocus system utilizing neural networks applied to automated multiwell plate storm microscopy. *In Bio-Optics: Design and Application (DTh2A. 7), Optical Society of America,* (2021).

[3] S. S. Goutam Buddha, **Ranjan Kalita**, and Bosanta R. Boruah, Optical sectioning microscopy with both mechanical and non-mechanical beam scanning mechanisms. *In 2019 Workshop on Recent Advances in Photonics (WRAP)*, 1-3 (2020).

[4] K. S. Malik, S. S. Goutam Buddha, **Ranjan Kalita**, and Bosanta R. Boruah, Estimation of maximum translation speed of a trapped particle in holographic optical tweezers. *Proc. of SPIE*, **11297** 112970Z (2020).

[5] **Ranjan Kalita**, and Bosanta R. Boruah, Effect of aberration on the electric field orientation around the focus of a polarized light beam. *Proc. of SPIE*, **10772**, 107720Y (2018).

[6] **Ranjan Kalita**, S. S. Goutam Buddha, and Bosanta R. Boruah, Laser scanning confocal microscopy using illumination beams with different polarization's in quick succession. *Proc. of SPIE*, **10772**, 107720I (2018).

[7] **Ranjan Kalita**, S. S. Goutam Buddha, and Bosanta R. Boruah, Suitability of holographic beam scanning in high resolution applications. *Proc. of SPIE*, **10499**, 104991P (2018).

[8] S. S. Goutam Buddha, **Ranjan Kalita**, and Bosanta R. Boruah, Estimation of point spread function of an imaging system using a programmable target. *Proc. of SPIE*, **10499**, 104991O (2018).

[9] **Ranjan Kalita**, and Bosanta R. Boruah, Confocal imaging with orthogonally polarized illumination beams. *Proc. of SPIE*, **9713**, 971316 (2016).

ACADEMIC ACHIEVEMENTS

[1] Awarded **SPIE Student Travel Grant** to attend *SPIE Optics + Photonics - 2018*, San Diego, California, USA. (August 19 - 23, 2018)

[2] Received **International Travel Support from SERB, DST, Govt. of India** to attend *SPIE Optics + Photonics - 2018*, San Diego, California, USA. (August 19 - 23, 2018)

[3] Presented the **second prize in the poster presentation** at the *Research Conclave-2018*, organized by Students' Academic Board, IIT Guwahati. (March 8 - 11, 2018)

[4] **Certificate of merit in the poster competition** organized by *IIT Patna OSA Student Chapter (during the DST-SERB School on "Modern Optics & Its Applications")*, Department of Physics, IIT Patna. (December 16, 2015)

[5] Presented **best poster award (3rd position, IITG category)** in the *TEQIP Symposium to celebrate the 2015 International Year of Light*, Department of Physics, IIT Guwahati. (October 31, 2015)

[6] Awarded **first prize in the poster competition** as a part of the *department's foundation day celebration*, Department of Physics, Gauhati University. (February 21, 2009)

CONFERENCE TALK/POSTER

[1] **Laser scanning confocal microscopy using illumination beams with different polarization's in quick succession**, *SPIE Optics + Phonotonics - 2018*, San Diego, California, USA. (August 19-23, 2018)

[2] **Effect of aberration on the electric field orientation around the focus of a polarizing light beam**, *SPIE Optics + Phonotonics - 2018*, San Diego, California, USA. (August 19-23, 2018)

[3] **Development of a standalone confocal imaging system with CGH based as well as galvanometer scanner based beam scanning mechanism**, *Research Conclave - 2018*, IIT Guwahati, India. (March 08-11, 2018)

[4] **Spatially varying aberration correction in a beam scanning confocal microscope**, *International conference on advances in optics and photonics (ICAOP-2017)*, Guru Jambheswar University of Science and Technology, India. (November 23-26, 2017)

[5] **Confocal microscopy and its applications**, *Research Conclave - 2017*, IIT Guwahati, India. (March 17-19, 2017)

[6] **Confocal imaging with pixel based aberration correction of the illumination beam**, *International conference on light and light based technologies (ICLLT-2016)*, Tezpur University, India. (November 26-28, 2016)

[7] **Imaging linear dichroism in a laser scanning confocal microscope**, *Research Conclave - 2016*, IIT Guwahati, India. (March 18-20, 2016)

[8] **Generation of boat-shaped beam using an arbitrary vector beam forming setup**, *TEQIP symposium to celebrate the 2015 International Year of Light (IYL-2015)*, IIT Guwahati, India. (October 31, 2015)

[9] **Optical sectioning microscopy using binary multiplex hologram based beam scanning**, *International conference in optics and photonics (ICOP-2015)*, Calcutta University, India. (February 20-22, 2015)

[10] **Investigation of low frequency oscillation of Dust particles in a dusty plasma**, *26th National Symposium on Plasma Science & Technology*, BIT-Mesra, Patna Campus, India. (December 20-23, 2011)

SCHOOL/ WORKSHOP/ TRAINING

[1] **One-Day workshop on vacuum technology and its application in optical science**, jointly organized by *SPIE IIT Guwahati Student Chapter and Pfeiffer vacuum* , IIT Guwahati, India (August 19, 2017)

[2] **Advanced microscopy and imaging techniques**, jointly organized by *DSS Imagetech Pvt. Ltd., Olympus medical system India Pvt. Ltd.*, IIT Guwahati, India (April 18-20, 2017)

[3] **SERB School on "Modern Optics & Its Applications"** IIT Patna, India (November 30- December 18, 2015)

[4] **South Asian Workshop on Optics & Photonics (SAWOP-2015)**, IIT Guwahati, India (November 17-18, 2015)

[5] **Recent trends in geospaital techniques**, jointly organized by *North Eastern Space Application Center (NESAC), and Indian Institute of Remote Sensing (IIRS-ISRO)*, (August 05-09, 2013)

[6] **SERB School on "Plasma Waves and Instabilities"** IASST, India (February 07-18, 2011)

TEACHING EXPERIENCE

◇ **Department of MSc Physics, Pub Kamrup College.** Dec 2021-Present
Assistant Professor (on temporary mode)

◇ **Department of Physics, IIT Guwahati** 2016-2018
Teaching Assistant for under-graduate and post-graduate laboratory courses.

DECLARATION

I hereby declare that all the information mentioned above is accurate to the best of my knowledge. And I bear the responsibilities for the correctness of the mentioned particulars.

Ranjan Kalita