

JOHN PRAKASH

Assistant Professor

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Profile

I do teach physical chemistry topics and guides students project in the area of physical photochemistry at Central University of Tamil Nadu, India. I did Ph.D. in the field of photophysical chemistry – fluorescence spectroscopy. I have introduced a novel spectroscopic technique, White Light Excitation Fluorescence (WLEF) for multipurpose applications in my PhD thesis. My field of research interest is “the development of spectroscopic tools for biological and analytical applications”. My research interest focused in the area of specialized spectroscopy techniques like laser spectroscopy and Imaging. I am motivated to teach Physical and Theoretical chemistry topics.

Teaching Interests

I am motivated to teach Physical and Theoretical chemistry topics. I teach basic organic and inorganic chemistry, molecular spectroscopy, quantum chemistry in UG level. In addition, I teach molecular spectroscopy and group theory in PG level. I do have Ten years of experience in Physical & Theoretical Chemistry (spectroscopy, group theory, kinetics, quantum chemistry, thermodynamics etc.) after my doctoral research. I am interested to teach Physical and Theoretical chemistry topics in Post-Graduation level and any chemistry topic in undergraduate level. Also, I had opportunity to responsibly carry out laboratory experiments (mainly physical and gravimetric) last 9 years. As part of curriculum, I have guided one MPhil thesis, 38 PG, 12 UG, and 7 PG Diploma dissertations.

My desire is to create a truly competitive arena where I work. I want to bring my enthusiasm and sense of confidence to the organization and to the people I work with. My involvement in various areas of activities at college has taught me crucial lessons on leadership & teamwork.

Research Interests

- Application of spectroscopic techniques in the development of instruments or sensors for biological fields, environmental monitoring, oil industry (analysis, quantification, exploration), etc.
- Development of novel sensors for biomedical applications especially cancer diagnostics
- Design of non-invasive instruments for in vivo applications
- Interested to learn and explore new techniques viz., laser spectroscopy, ultrafast spectroscopy

Experience

Asst. Professor Central University of Tamil Nadu, India	Dec 2017 to Present
Asst. Professor Poly Technic College, Nattakom, Kottayam, India	Oct 2017 to Nov 2017
Asst. Professor Dept. of Chemistry, Deva Matha College Kuravilangad, India	July 2014 to Oct 2017
Post-Doctoral Fellow, Dept. of Applied Mechanics IIT Madras, India	April 2014 to July 2014
Research Associate, Dept. of Chemistry IIT Madras, India	Aug 2013 to March 2014

Education

PhD (Chemistry)	CGPA-9	Indian Institute of Technology Madras	2013
MSc Chemistry	88.9 %	St. Thomas College Pala, MG Uty	2008
BSc Chemistry	98.6 %	St. Thomas College Pala, MG Uty	2006

List of Publications

Peer-Reviewed Research Articles- 14

1. A. Mary, N. Kalangadan, **J. Prakash**, S. Sundaresan and K. Rajaram Relative fitness of wild-type and phage-resistant pyromelanogenic *P. aeruginosa* and effects of antibiotic combinatorial therapy on resistance formation, *Heliyon* (2023) (Under review)
2. A. Vijayan and **J. Prakash** Emerging Analytical Methods for Quantitative Determination of Biofuel-Petroleum Fuel Blends Composition, *Journal of Petroleum and Environmental Biotechnology* (2023) (Under review)
3. J. Mishra, A. Vijayan, J. Swain and **J. Prakash** Fluorescence Lifetime of Pyrene Butyric Acid as a Versatile Sensing Tool for Monitoring Self-assembled systems and Microenvironment, *Dyes & Pigments* (2023) (Under review)
4. G. Suku, A. Vijayan and **J. Prakash** Micelle-assisted Early Detection of Brodifacoum with Investigations into Serum Protein Binding and Bioavailability, *Analytical Methods* (2023) (Under review)
5. A. Vijayan and **J. Prakash** Probe-based spectrophotometric quantification of petrol-ethanol fuel blends for field-able applications, *Green Analytical Chemistry* **3**, (2022) <https://doi.org/10.1016/j.greeac.2022.100043>
6. A. Mohan and **J. Prakash** Fabrication of eco-friendly hydrogel strips for the simultaneous quantification of heavy metal ions in aqueous environment *Dyes and Pigments* **199** (2022) 110045
7. **J. Prakash** and A. K. Mishra Simultaneous Quantification of Multiple Polycyclic Aromatic Hydrocarbons in Aqueous Media using Micelle Assisted White Light Excitation Fluorescence *Scientific Reports* **10** (2020) 8921-
8. **J. Prakash** and A. K. Mishra, Convenient determination of fluorescence quantum yield using a combined electronic absorption and fluorescence spectrometer *Rev. Sci. Instru.* **87** (2016) 013110-
9. **J. Prakash** and A. K. Mishra, Quantification of doxorubicin in biofluids using white light excitation fluorescence, *J. Biophotonics*, **7** (2014) 607-616.
10. **J. Prakash** and A. K. Mishra, Dip-probe design and application: fast and reliable method for the Quantification of engine oil in petrol, *Meas. Sci. Technol.* **24** (2013) 105502-105510
11. **J. Prakash** and A. K. Mishra, Introduction of a Novel Fluorescence Based Method for the Composition Estimation of Petroleum Fuel - Biofuel Blends, *Fuel*, **108** (2013), 351-355.
12. **J. Prakash**, Solubilization of bromadiolone in humic acid pseudomicellar media, *Advances in Environmental Research*, **1** (2012), 211-221.
13. **J. Prakash** and A. K. Mishra, White light excitation fluorescence (WLEF) Part II. Analysis of complex multifluorophoric systems, *Anal. Methods*, **3** (2011), 368-373.
14. **J. Prakash** and A. K. Mishra, White light excitation fluorescence (WLEF) Part I. Exploring the use in analytical fluorimetry, *Anal. Methods*, **3** (2011), 362-367.

Publications in Conference Proceedings- 20

1. Ganesh S and J. Prakash; [July 2023] “Evinced & Early Detection of Insoluble Brodifacoum: Bioavailability & Binding Interaction with BSA” presented ICGC 2023 organized by University of Ladakh, Green Chemistry Network Centre and Indian Society of Analytical Scientists 3rd to 5th July 2023 (Oral Presentation)
2. Anupama Vijayan and J. Prakash; [Mar 2022] “LED mini-Spectrophotometer: A Portable Device for Quantification of Ethanol in Fuel Blends” Poster presented at Institution Innovation Council -CUTN Ministry of Human Resource Development-IIC - India: Best innovation Award -3rd Prize
3. Bhagyasree V S and J. Prakash; [Mar 2022] “An Eye for the food Quality: Quantitative Visualization of Food color” Poster presented at Institution Innovation Council -CUTN Ministry of Human Resource Development-IIC - India: Best innovation Award -3rd Prize
4. Bhagyasree V S and J. Prakash; [Jan 2022] “Behind the Hue-Beyond the Eyes; Determination of food color” Poster presented at National E-Poster Presentation Association of Chemistry Teachers (ACT) Mumbai, India
5. A. Mohan and J. Prakash An Opto-sensor, Real-time Detection Of Heavy Metal Ions In Drinking Water NCFC – 2020 March 29-30, 2021 Central University of Tamil Nadu, India
6. A. Mohan and J. Prakash White Light Emitting Opto-sensor For Real-time Detection Of Heavy Metal Ions In Drinking Water SUCH –2020 August 27-28, 2020 Annamalai University, India
7. A. Mohan and J. Prakash Visualization & Quantification of Heavy Metal Ions in Drinking Water Using Plant Pigments TSRP-2020, January 5- 9 2020 BARC Mumbai, India
8. Tanza Baby, Anandhu Mohan, Monishri S, Guna Nandhini G, Sowmya K P, Akshatha S, John Prakash* “Transmogrifying ‘Invisible’ Carcinogens (PAH) in Water Using Sub-Microscopic Agglomerated Molecules” - Transition - 2019 February 22-23, 2019 Department of Chemistry, Central University of Tamil Nadu
9. J. James and J. Prakash Miniaturized Multimodal Spectrometer for Cancer Diagnoses-A Preliminary Study, Emerging Trends in Nanocomposites -2017, Oct 12-13, St. Thomas College Pala, India.
10. J. Prakash and A. K. Mishra “Multipurpose Fiber Optic Spectrometer: *Determination of Fluorescence Quantum Yield*” ICSIMR-2017, June 30-July 1, IIT Guwahati, India.
11. J. Prakash “Zero Cost Eco-Friendly Water Purifier from ‘Market Waste’” Green Chemistry for Environmental Sustainability -2017, Feb 7-8, Bharata Matha College Thrikakara, India.
12. J. Prakash and A. K. Mishra, “Spectroscopic Tool for Cancer Diagnoses-A Preliminary Study” RTS-2014, June 20-21, IIT Madras, India.
13. J. Prakash and A. K. Mishra, “Micelle Assisted Multi-probing of PAHs in Aqueous Media using White Light Excitation Fluorescence” ACCIS-2013, November 20-23, North Bengal University, India
14. V. Singh, J. Prakash and A. K. Mishra, “Determination of Absolute Quantum Yield using a Homemade Fiber Optic Spectrometer” CiHS-2013, August 21 IIT Madras, India.
15. J. Prakash and A. K. Mishra, “WLEF technique for the in vitro quantification of Anticancer drug, Doxorubicin (DXR) in Biofluids” Biomers-2012, September 15, IIT Madras, India
16. J. Prakash and A. K. Mishra, “Fluorometric Determination and Quantification of Anticancer drug, Doxorubicin in Biological Fluid-serum” CiHS-2012, August 22, IIT Madras, India
17. J. Prakash and A. K. Mishra, “Advantages of WLEF in the Analytical Fluorimetry of Multifluorophoric System- Biodiesel” CPL-2012, March 9-10, IIT Guwahati, India
18. J. Prakash and A. K. Mishra, “Quality monitoring of Biodiesel-Diesel blends using White Light Excitation Fluorescence (WLEF)” TSRP-2012, January 4-7 BARC Mumbai, India-**Best Poster award**
19. J. Prakash and A. K. Mishra, “The Advantages of Unmonochromated Broad Band Excitation in the Analytical Fluorimetry of Complex Multifluorophoric Systems” ICVC-2011, October 11-13, IGCAR Kalpakkam, India.
20. J. Prakash and A. K. Mishra, “Humic acid enhanced solubilization of bromadiolone in aqueous media” CiHS-2011, August 24 IIT Madras, India.

Invited Talks- 12

1. "Ozone Layer Protection: Our role as Chemist" Webinar on Ozone Day organized by Chemistry department on 16/09/2021 at Deva Matha College Kuravilangad Kerala
2. "Group Theory in Chemistry: A competitive Approach" Saviezza – the Annual Stephanian Erudite Series organized by Chemistry department on 22/07/2021 at St. Stephen's College Uzhavoor Kerala
3. "Fluorescence in the World of Chemistry" National Seminar on Recent Advances in Chemistry organized by Chemistry department on 07/02/20 at Assumption College Chenganaserry Kerala
4. "WLEF, A tool to evince 'Invisible' contaminants in Aqueous Media" All Kerala Inter-collegiate Quiz & IYPT-2019 organized by Chemistry department on 16/12/19 at St. Mary's College Mannarcaud Kerala
5. "Evincing 'Invisible' Contaminants in Aqueous Media - A Fluorescence Approach" Science of Synthesis, Organized by Thieme & Chemistry department on 16/10/19 at Central University of Tamil Nadu, India.
6. "Chemists' Future", Invited Talk Organized by Chemistry department on 20/09/19 at St. Stephen's college Uzhavoor.
7. "WLEF-Layman's Perspective", Dr. K. Sundareshan memorial National seminar 2019, Organized by Chemistry department on 16/8/19 at SN College Kollam.
8. "Chemistry -How to approach Problems" Science Camp -2018 at Central University of Tamil Nadu on 4-7/4/2018
9. "Fluorescence-"simple but Powerful", Prof. T.R. Anantharaman memorial and Dr. A. M. Chacko Endowment National seminar 2017-18, Organized by Chemistry department on 02/03/18 at Union Christian college Aluva.
10. "Fluorescence-A new Gen Approach" Transition-2018, Organized by Chemistry department on 15/10/19 Central University of Tamil Nadu, India
11. "CY-Chemistry" Chemistry Association Inauguration at St. Stephen's College Uzhavoor, January 25, 2017, India.
12. "Fluorescence-Simplest Spectroscopic Tool, an overview of WLEF" RAC-2015, December 14-15, Govt. Brennen College Thalassery, India

Resource Person

1. "Quiz Master-All Kerala Inter-Collegiate Quiz Competition, ChemiQuiz" 2015, 2016, 2017, 2018, Deva Matha College Kuravilangad, India.
2. "Quiz Master-Science Quiz-2017" Chemistry Association Alphonsa College Pala, India.

Research Achievements

- Inventing, developing, and validating a novel technique for chemical analysis, White Light Excitation Fluorescence (WLEF). In WLEF, white light (i.e., radiation across a broad range of ultraviolet and visible wavelengths) is used to excite the sample; the spectrum of the light emitted from the excited sample is then measured and analysed to determine the composition of the sample.
- Demonstrating that WLEF is suitable for use in transparent and low scattering liquid media, and that it shows particular promise for the analysis of samples comprised of multiple fluorescing components.
- Laying out the theoretical framework of WLEF as an analytical technique
- Adapting the WLEF instrument to quantify pharmaceuticals and metabolites present in biofluids. A dual-beam optical spectrometer was incorporated into the instrument to achieve this objective.
- Exploiting the entire WLEF spectrum to quantify multiple analytes concurrently.
- Constructing a portable, low cost, modular, and highly sensitive optical spectrometer for the simultaneous measurement of the absorption and fluorescence spectra of samples
- Modifying the WLEF instrument using a dip-probe fiber optic spectrometer to quantify analytes remotely

Academic Achievements

- Won **Certificate of Excellence in Reviewing -2021** by Indian Journal of Science & Technology
- Won 2nd Prize of “Eli Lilly & Co Asia’s Outstanding Thesis Awards-2013”
- **Best Scientific Poster award** in the 11thTrombay Symposium on Radiation and Photochemistry (TSRP-2012) at BARC during 4-7 January 2012
- Won CSIR-JRF: **2007 Dec** and **2008 June**
- University 3rd Rank for M. Sc. Chemistry (Mahatma Gandhi University, 2008)
- Won the proficiency prize in studies in the 2nd P.G. class during the academic year 2007-2008
- Won the **First prize** in the All Kerala Intercollegiate Chemistry Quiz competition on 28th February 2008
- University 3rd Rank for B. Sc. Chemistry (Mahatma Gandhi University, 2006)
- Won the **Third prize** in the Prof. P. J. Joseph Memorial All Kerala Intercollegiate Science Quiz competition in the year 2006-2007
- Won the proficiency prize in studies in the 3rd DC class during the academic year 2005-2006
- Won the **First prize** in the Prof. Aleyamma Abraham Memorial Intercollegiate Chemistry Quiz competition in the year 2005-2006
- Won the proficiency prize in studies in the 2nd DC class during the academic year 2004-2005
- Won the **Third prize** in School Mathematics Exhibition (sub-district level) in the year 1997-1998

Instruments Designed

- Fiber Optic Spectrometer for simultaneous measurement of Fluorescence and UV-Visible electronic absorption
- Dip-probe spectrometer for WLEF measurement
- Dual beam fiber optic spectrofluorimeter for self-referenced measurement

Research Project (Completed)

Design and Fabrication of a Portable Spectrometer for online Analyses of Poly Aromatic Hydrocarbons (PAH) in Water 2018-20 (as PI: Dr. John Prakash)

Sponsoring Agency: UGC -Start Up Grant of 100000

Seminars & Workshops Organized (06)

1. A **seven-day National Workshop** on the theme **Exploring the Science with Sophisticated Instruments** in collaboration with the NIT Warangal, organised under the DST- STUTI scheme held at Central University of Tamil Nadu, from 21st to 27th June, 2023
2. A **seven-day National Workshop** on the theme **Hands-on training on Sophisticated Instrumentation Techniques** in collaboration with the NIT Warangal, organised under the DST- STUTI scheme held at Central University of Tamil Nadu, from 8th to 14th February, 2023
3. National **one-week Faculty Development Programme on Carbon Capture & Storage** organised at Department of Chemistry, Central University of Tamil Nadu, from 21st to 25th February, 2022
4. **National Conference** on Frontiers in Chemical Sciences (**NCFC -2020**) organised at Department of Chemistry, Central University of Tamil Nadu, from 29th to 30th March, 2021
5. **TRANSITION - 2019**, a **two-day national level lecture workshop** on “Recent Trends in Chemistry” organized at Department of Chemistry, Central University of Tamil Nadu, during 22nd -23rd February 2019
6. **Protect Ozone Layer - Save Ourselves (POLSO -2016) one day programme** on the theme “Ozone and Climate: Restored by a World United” in collaboration with KSCSTE as part of Ozone Day Celebration held at Deva Matha College Kuravilangad on 30th September 2016

Membership in Academic Bodies

- ✦ Member RSC -Web applicant (Membership ID: 666637)
- ✦ Lifetime member -ISRAPS (L-505)
- ✦ ACS member - (ID: 31886586)
- ✦ Board of Studies Member -Chemistry CUTN (2019-22)

Faculty Development Programme/Workshops Attended

Workshop (National -16)

1. [2021-22]: National one week FDP on **Carbon Capture & Storage** organized by Department of Chemistry CUTN from 21 to 25 February 2022
2. [2021-22]: UGC Sponsored “**2nd Workshop on E –content Development and Online Pedagogy**” organized by HRDC NEHU from 24 to 31 January 2022 in online mode.
3. [2021-22]: Online National Level Faculty Development Program (FDP) on “**Materials for Photonic Applications**” conducted by Mahatma Gandhi Institute of Technology Hyderabad during 9th-13th August, 2021
4. [2021-22]: 5 days workshop on **Techno-Pedagogical Tools & Techniques** organized by Team MOOCs ICT @ CUTN From 5 – 9 July 2021
5. [2021-22]: UGC STRIDE Virtual 10 days FDP on “**Mitigating Climate Change**” organized by the Central University of Tamil Nadu, Thiruvavur in Association with UGC STRIDE from 26th April to 6th May 2021.
6. [2020-21]: SWAYAM –ARPIT 2020 Course for Career Advancement Scheme(CAS) promotion 16 weeks **Online Refresher Course in Chemistry for Higher Education Faculty** with a "A" Grade in the proctored examination held on December 2020
7. [2020-21]: Five days Online Faculty Enrichment Programme on “**Foundation of Stereochemistry**” conducted by the Research and Post Graduate Department of Chemistry, MES Keveeyom College Valanchery in association with Chemical Research Society of India, TVM-KOC-CAL Chapter from 16-20 November 2020.
8. [2020-21]: Seven Days Online Faculty Development Programme on “**MOODLE**” organised by MOOC-ICT@ CUTN, from September 21-29, 2020.
9. [2020-21]: One Week Online Short Term Faculty Development Programme on “**Towards a Digital Era of Teaching and Learning**” which was delivered as MOOC with four quadrants, organised by UGC-HRDC, University of Kerala, Thiruvananthapuram in collaboration with KSMDB College, Sasthamcotta from August 12-18, 2020.
10. [2020-21]: National Level Faculty Development Programme (FDP) on “**MATLAB Tools & Applications**” organized by Department of Mathematics, Babu Banarasi Das Northern India Institute of Technology (AKTU College Code: 056), Lucknow from August 07-08 & 10, 2020.
11. [2020-21]: A five-day National Level e-FDP on “**Challenges in Chemistry and Its application toward Energy Resources**” organized by the Department of Chemistry, Faculty of Humanities and Science, Dr. MGR Educational & Research Institutes from 3 - 7 August 2020
12. [2020-21]: 7-day Virtual Faculty Development Program on “**Instructional Design Using AGILE-ADDIE**” organized by ICT Academy of Kerala from 28-July-2020 to 02-august-2020.
13. [2020-21]: Online course on “**Remote Sensing & GIS Technology and Applications for University Teachers & Government Officials**” which was conducted by Indian Institute of Remote Sensing (IIRS), ISRO Dehradun, during 13-06-2020 to 01-07-2020.
14. [2019-20]: UGC Sponsored **Orientation programme (OP-107)** conducted by the UGC-Human Resource Development Centre, University of Calicut from 6th to 26th November 2019.
15. [2018-19]: SWAYAM –ARPIT -2018 Course for Career Advancement Scheme(CAS) promotion 16 weeks **Online Refresher Course in Chemistry for Higher Education Faculty** with a "A" Grade in the proctored examination held on 30.03.2019
16. [2018-19]: MHRD, Govt. of. India approved **refresher course** (15 days) on the **class room chemistry-concepts and the curiosities in chemistry** at Jhargram Raj College, West Bengal from 06th to 20th December, 2018.

Workshop (National -06; International -01)

1. [2023-24]: A seven-day National Workshop on the theme **Exploring the Science with Sophisticated Instruments** in collaboration with the National Institute of Technology Warangal, organised under the DST- STUTI scheme held at Central University of Tamil Nadu, from 21st to 27th June, 2023
2. [2022-23]: A seven-day National Workshop on the theme **Hands-on training on Sophisticated Instrumentation Techniques** in collaboration with the National Institute of Technology Warangal, organised under the DST- STUTI scheme held at Central University of Tamil Nadu, from 8th to 14th February, 2023
3. [2022-23]: 15 Days **Yoga Training Programme** conducted for the Celebration of International Yoga Day (IYD-2022) held at Central University of Tamil Nadu from 6th to 20th June 2022
4. [2020-21]: One Day Online National Workshop entitled “**ICT Tools for Chemistry Teachers**” organized by Guru Angad Dev Teaching Learning Centre, SGTB Khalsa College, University of Delhi under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education on 22nd February 2021.
5. [2020-21]: Indo-Israel workshop on “**Membranes in Water Treatment: Opportunities & Challenges**” Organized by School of Environmental Studies, Cochin University of Science and Technology, Kerala, India held on 05-06 November 2020.
6. [2020-21]: International workshop on “**Learn Moodle 3.9 Basics**” organized by Moodle HQ (4 Weeks) October 2020.
7. [2020-21]: National workshop on “**Google Apps for Education & Moodle**” organized by IQAC & Dept of Commerce, Rajaram College, Kohlapur held on 2-3 July 2020.