

Dr. Sumit Singhal

Postdoctoral Research Associate
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I have been working with nonlinear optical spectroscopic techniques to study photophysical and photochemical processes occurring on femtosecond to millisecond time scale. I have gained my experience at globally renowned labs located in India, Europe, and USA.

Technical Skills:

Instruments handling and Troubleshooting:

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|--|---|---|
| • 2D Electronic Spectroscopy. | • Time Correlated Single Photon Counting (TCSPC). | • Photothermal Spectroscopy. |
| • Noncolinear Optical Parametric Amplifier (NOPA). | • UV-VIS Spectrophotometer. | • Interferometry. |
| • Femtosecond Ti: Sapphire Lasers and Amplifier. | • Fluorimeter. | • Optical fiber & other optical components. |
| • Pulse shaper. | • Lock-in-amplifier and Boxcar average. | • Cryostat. |

Programming and statistical data analysis:

- Python
- Fortran
- LabVIEW
- Origin Lab

Safety Trainings:

- Laser safety training
- Environment, Health & Safety training

Experience: (>10 years)

Postdoctoral research associate

- Biological research Center, Szeged (November/2022 - Present)

Adjunct assistant professor

- Savitribai Phule Pune University, Pune (July/2022 - November/2022)

Postdoctoral research associate

- University of Colorado Boulder, USA (June/2019 - October/2021)

Senior research fellow

- Indian Institute of Technology Kanpur, India (January/2013 - December/2018)

Junior research fellow

- Indian Institute of Technology Kanpur, India (January/2011 - December/2012)

Project assistant

- Indian Institute of Technology Kanpur, India (July/2010 - December/2010)

Certificates:

- UGC-CSIR June 2010 (Chemical Sciences)
- GATE 2010 (Chemistry)

National Award/Scholarships:

- Senior research fellowship for 2013-2015 (Awarded by UGC India)
- UGC-Junior research fellowship for 2011-2012 (Awarded by UGC India)

Academic Degrees:

Doctor of Philosophy (Physical Chemistry)

- Indian Institute of Technology Kanpur (2010–2018)

Master of Science (Organic Chemistry)

- Hindu College, University of Delhi (2008-2010)

Bachelor of Science (General)

- Maharshi Dayanand University Rohtak (2004-2007)

Languages:

- Hindi
- English

Extra-Curriculars:

- Swimming
- Cooking
- Traveling

Publications:

Peer reviewed Journals or Books:

- (1) **Singhal, S.**; Goswami, D. Unraveling the Molecular Dependence of Femtosecond Laser-Induced Thermal Lens Spectroscopy in Fluids. *Analyst* **2020**, 929–938. <https://doi.org/10.1039/c9an01082c>.
- (2) **Singhal, S.**; Goswami, D. Thermal Lens Study of NIR Femtosecond Laser-Induced Convection in Alcohols. *ACS omega* **2019**. <https://doi.org/10.1021/acsomega.8b02956>.
- (3) **Singhal, S.**; Dinda, S.; Goswami, D. Measurement of Pure Optical Nonlinearity in Carbon Disulfide with a High-Repetition-Rate Femtosecond Laser. *Appl. Opt.* **2017**, 56 (3), 644. <https://doi.org/10.1364/AO.56.000644>.
- (4) Kumar, A.; Kumar, S. K. K.; **Singhal, S.**; Goswami, D. Study of Two Xanthene Dyes Using Spectrally Resolved Three Pulse Photon Echo Spectroscopy Keywords. *Curr. Sci.* **2015**, 108 (10), 1801-1803.
- (5) Das, D. K.; Makhal, K.; **Singhal, S.**; Goswami, D. Polarization Induced Control of Multiple Fluorescence from a Molecule. *Chem. Phys. Lett.* **2013**, 579, 45–50. <https://doi.org/10.1016/j.cplett.2013.06.027>.
- (6) Mondal, D.; **Singhal, S.**; Goswami, D. Femtosecond Laser-Induced Photothermal Effect for Nanoscale Viscometer and Thermometer. In *Selected Topics in Photonics*; **2018**; Vol. 75, pp 13–17. https://doi.org/doi.org/10.1007/978-981-10-5010-7_2
- (7) Gupta, R.K; Verma, S.; **Singhal, S.**; Suyrakant; Goswami, D. Investigating the effects of intermolecular interactions on nonlinear optical properties of binary mixtures with high repetition rate femtosecond laser pulses. *PeerJ Physical Chemistry*, **2022**. <https://doi.org/10.7717/peerj-pchem.23>.

Conference proceedings:

- (1) Goswami, S.; **Singhal, S.**; Banerjee, A.; Goswami, D. Sensitive Detection of Phase Separation with Femtosecond Thermal Lens Spectroscopy. In *2019 Workshop on Recent Advances in Photonics (WRAP)*; IEEE, 2019; pp 1–2. <https://doi.org/10.1109/WRAP47485.2019.9013833>.
- (2) **Singhal, S.**; Goswami, D. Sensitive Dual Beam Thermal Lens Detection of Convection in Methanol. In *13th International Conference on Fiber Optics and Photonics*; OSA: Washington, D.C., 2016; p P1A.16. <https://doi.org/10.1364/PHOTONICS.2016.P1A.16>.
- (3) **Singhal, S.**; Roy, P. P.; Goswami, D. Importance of Hydrogen Bonding in Thermal Lens Study of Highly Absorbing Liquids. *Front. Opt.* **2015**, FTu5E--5.
- (4) **Singhal, S.**; Bhattacharyya, I.; Goswami, D. Exploring the Critical Role of Detection Aperture in Thermal Lens Measurements. In *2015 Workshop on Recent Advances in Photonics (WRAP)*; IEEE, 2015; pp 1–4. <https://doi.org/10.1109/WRAP.2015.7806016>.
- (5) Maurya, S. K.; **Singhal, S.**; Goswami, D. Study of Self Defocusing in Liquids Using Single Beam Z-Scan with High Repetition Rate Laser Pulses. *2012 Int. Conf. Fiber Opt. Photonics, PHOTONICS 2012* **2012**, 2–4.

References:

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