10/08/2025

Sarthak Dash

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Website
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- Results-driven photonics researcher with *6+ years of experience* in fiber lasers, nonlinear optics, optical system design, and numerical simulations.
- Proven ability to develop *high-performance laser systems* for industrial and scientific applications.
- Strong track record of *industry collaboration*, mentoring, and publishing in top-tier journals (6+) and conference proceedings (12+).

Technical Skills

- **Fiber processing:** Experienced in stripping, cleaving, splicing, recoating of standard and speciality fibers.
- **Laser and Amplifiers:** Design and fabrication of fiber lasers (CW, low-noise, pulsed), Raman fiber lasers, and amplifiers.
- **Free-space optics:** Built pulse shapers, grating filters, beam combiners, collimators, and coupling systems.
- **Nonlinear optics:** Expertise using nonlinear crystals (BBO, LBO, PPLN) and nonlinear fiber optics.
- **Programming and Simulation:** Well versed in Python, Julia, MATLAB, COMSOL for optical modelling.
- **Technical Leadership:** Mentored 4+ graduate students, reviewed 4+ journal papers, assisted in 2 graduate-level courses.

Experience

(03/2025 – present) Sr. Research Fellow | Indian Institute of Science, Bangalore

- **Extending visible laser to blue-violet region** using Raman fiber lasers and mentoring PhD students.

(08/2024 – 03/2025) Project Associate | Indian Institute of Science, Bangalore

- **Engineered frequency-doubled wavelength-tunable visible laser** achieving power in green to red for biomedical and industrial use.

(2018 – 2024) PhD Researcher | Indian Institute of Science, Bangalore

- **Developed novel Raman fiber lasers** with 5x improved spectral density, >99% spectral purity enabling tunable high-power applications.
- **Designed and optimized a supercontinuum source**, achieving best in-class (±1°C) accuracy in silicon wafer temperature monitoring.
- **Developed pulsed source for photoacoustic applications,** emitting in NIR and visible wavelengths.
- **Published 4+ peer-reviewed journal papers** and presented at 12+ international conferences.
- **Reviewed technical papers for top-tier optics journals**, ensuring high scientific standards.
- **Mentored 4 graduate students**, guiding them in laser development and system optimization.

Industry Collaboration

- **Partnered with a leading semiconductor equipment manufacturer** to develop laser-based temperature monitoring solutions.
- **Characterized and optimized laser properties** for several industrial and medical partners, and debugging of production issues.

Achievements

- **SPIE Photonics West "Fiber lasers" Travel Grant** (2024 & 2025)
- **SERB International Travel Support (ITS)** (2024)
- **Best Oral Presentation Award**, 11th CeNSE Student Research Symposium (2024)
- **National-Level Examinations**: GATE (AIR 126, 2018), NET (2017), IIT-JAM (AIR 501, 2015)

Education

PhD | Indian Institute of Science, Bangalore (Aug 2018 – Oct 2024)

Thesis: *Architectures for linewidth reduction in cascaded Raman fiber lasers and applications*
Supervisor: Prof. V.R. Supradeepa

Master of Science in Physics | NIT Rourkela (2015 – 2017)

Selected publications

Peer-reviewed journals

1. **Dash, S.**, *Deheri, R.*, Choudhury, V., Supradeepa, V. R., "Fourier spectral shaper assisted feedback for wavelength and linewidth control of cascaded Raman fiber lasers," Optics Letters, 50(1), 201-204 (2025).
2. **Dash, S.**, Deheri, R., Supradeepa, V. R., "Linewidth reduced cascaded Raman fiber lasers and their harmonic conversion for visible laser sources," Optics Express, 32(12), 20629–20637 (2024).
3. Deheri, R., **Dash, S.**, Supradeepa, V. R., "Cascaded Raman fiber lasers with ultrahigh spectral purity," Optics Letters, 47(14), 3499–3502 (2022).
4. Goswami, A., Padmanabhan, S., **Dash, S.,** Prakash, J., Supradeepa, V.R., "Pulsed cascaded Raman fiber laser widely tunable in the second near-infrared and visible window for hyperspectral photoacoustic imaging," Opt. Lett. 50, 2223-2226 (2025).

Conference proceedings

- **S. Dash**, A. Goswami, R. Deheri, S. Avasthi, and V. Supradeepa, "Multi-point thermal monitoring of silicon wafer under processing utilizing a spectrally shaped supercontinuum source," in High-Power Laser Materials Processing: Applications, Diagnostics, and Systems XIII (SPIE, 2024), 12878, pp. 123–126.
- S. Arora, **S. Dash**, S. Pal, C. Lakshmi, V, Supradeepa "Spectral Beam Combining of Narrow-Linewidth Lasers from a Phase Modulated Frequency Comb-Based Seed Source," in Advances in Photonics Integrated Circuits, LASER and Applications, pp 135–140 (PHOTONICS 2023).

(Complete list available in google scholar)