

DR NISHTHA CHOPRA

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SKILLS

- Optical modelling – ZEMAX/Fourier Optics/Ray tracing/Wave Optics
- Optical System Assembly – Free space & Fiber coupled
- Prototyping - Klayout CAD(Chip Design)/Semiconductor /Optical systems
- Electromagnetic Simulation - COMSOL
- Python/Numerical Modelling - using Pandas, SciPy and NumPy and good knowledge of TensorFlow and Pytorch
- Spectral/Image processing
- Pump-probe spectroscopy Measurement
- RF Measurement/Anechoic Chamber
- Multisim/Ultimec - PCB Layout
- Project & Team Leadership

PROFESSIONAL SUMMARY

Proven ability to lead teams, **manage multi-phase projects, and drive innovation in Deep Tech**. Skilled in writing business proposals, conducting cost analysis, performing risk assessments, and effectively communicating with stakeholders.

Over nine years of hands-on experience in **designing and prototyping advanced optical systems, specializing in free-space optics, semiconductor devices, RF/mm-wave technologies**. Skilled in translating wave and ray optics models into real-world technologies for **imaging and spectroscopy systems**. **Worked across UK government, academia and defense R&D with applications spanning sensing, diagnostics and optical metrology**.

PROFESSIONAL EXPERIENCE

Principal Optical Engineer – Optics & Photonics. Leonardo – Aug 2025 – present | Basildon, UK

- **Technical lead engineer within a multi-million-pound electro-optical (EO) stealth programme**, establishing MWIR and SWIR characterisation facilities for evaluation of advanced coatings and low-signature materials.
- **Developing semi-automated measurement workflows**, integrating motion control and data acquisition to enhance precision and repeatability.
- **Advancing applied research on biomimetic and metasurface structures**, including moth-eye and metalens structures for next-generation low-observable and sensing applications.
- **Technical lead engineer for the design and build of photonic integrated circuit (PIC) test benches within a ~£300 k demonstrator** on miniaturised free-space optical communication (FSOC) systems, defining test specifications, substrates, and beam-steering evaluation methods.
- Work conducted within a **security-cleared applied-research environment** focused on next-generation defence photonics.

Research Associate - Technical Lead. University of Warwick - November 2021 – August 2025 | Coventry, UK

- **Developed III-V photonic emitters** for dynamic beam shaping achieving system compactness and 100% amplitude modulation
- **Pioneered** a diffraction-limited **imaging setup** achieving 2x

EDUCATION

October 2013 - May 2017

PhD: Applied Physics (THz Spectroscopy & Photonics)
Queen Mary University of London (QMUL)
London, UK

September 2011 - September 2012

Master of Science (MSc):
Nanoelectronics
University of Manchester
UK

June 2007 - May 2010

Bachelor of Technology (B. Tech): Electrical and Electronics Engineering
SRM University
Chennai, India

bandwidth

- **Led multi-phase technology** (patent; TRL level 4) that improves spectrometer's stability by 95%
- **Lead Scientist, Project Lead and Co- Investigator on various projects totalling more than £9.5M** —overseeing strategy and stakeholder engagement
- Applied **diffractive optical elements (DOE)** in dual-beam THz spectroscopy systems; experienced in DOE design principles and practical implementation
- Fabricated **passive THz Metasurfaces** functioning as spectral filters, with working knowledge of diffractive and nanostructure-based light control
- Hands-on use of **waveplates** and **Wollaston prisms** for polarization-sensitive measurements and optical alignment.
- **Skilful** in project management and budget allocation

Electromagnetic Radiation Scientist - UK Health Security Agency (UKHSA) - *May 2017 - October 2021 | Didcot, UK*

- Expert in **RF measurement**, system performance evaluation, and signal processing – conducted radiation exposure measurements and data analysis covering 30+ UK sites
- Developed & tested an **Electric & Magnetic Field Database** (SQL), funded by EPRI, USA
- **Advised standard bodies** (ICNIRP, UK Government) on EMF health risks
- **Skilled in writing** business proposals and technical reports for policy development. **Supervised** students on research projects

AWARDS

- Exceptional Performance and Contribution, 11/01/24, Warwick Physics
- Institute of Advance Studies Award, £2500
- Science Communication Award 2019, 2019, Runner-up, 'PHEnominal Award' in Science Communication Category
- Winner, 'Best Representative Image of an Outcome' (BRIO), 2018, Qatar National Research Fund
- PhD Research Commercialization, 2017, Shortlisted by Imperial College's Deep Science Ventures for Start-up Funding

Publications (Selected; full list: [HTTPS://BIT.LY/NC376](https://bit.ly/nc376))

1. **N. Chopra** & J. Lloyd-Hughes, Dual-beam THz spectrometer with low-aberration optics and off-axis multipixel photoconductive emitters, *ACS Photonics*, 2025
2. J. Lloyd-Hughes, **N. Chopra**, J. Deveikis et al., A Tutorial on THz Pulse Analysis, *J. Infrared Millim. Terahertz Waves*, 2025
3. **N. Chopra** & J. Lloyd-Hughes, Optical designs for diffraction-limited THz spectroscopy using OAP mirrors, *J. Infrared Millim. Terahertz Waves*, 2023
4. **N. Chopra**, J. Deveikis & J. Lloyd-Hughes, Active THz beam shaping using a 1D array of photoconductive emitters, *Appl. Phys. Lett.*, 2023
5. **N. Chopra** & J. Lloyd-Hughes, System and method for dual-beam THz spectroscopy, **UK Patent Application No. 2414810.8** (filed Oct 2024)
6. IEEE, Recommended Practice for Nanoscale and Molecular Communication Framework, *IEEE Std 1906.1-2015*