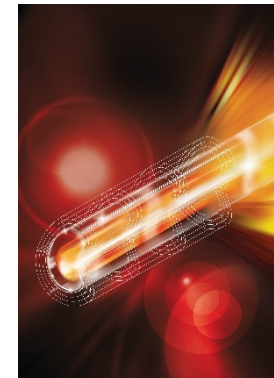
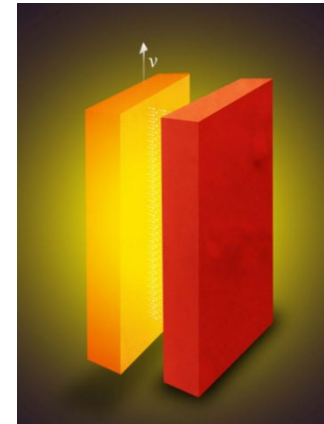


# Experimental Photonics

## Multiple Post-Doctoral Positions

**Experimental** Expertise in any one of the following topics/areas is highly desired

- Single photon level measurements , quantum communications
- Computational imaging, super-resolution imaging, biomedical imaging
- Quantum dots, 2D materials, quantum devices, quantum transport
- Single molecule spectroscopy/imaging
- Fluorescence microscopy
- Optical manipulation of spin , ODMR, Magnetometry, NV centers
- Nanofabrication (Metasurfaces, plasmonics, silicon photonics)
- Streak camera or time-correlated single photon counting experiments
- Ultrafast spectroscopy, pump-probe measurements
- Single nanoparticle/nanoantenna experiments
- Coupling of single quantum emitters to nanophotonic structures
- Cold atoms and quantum optics
- Infrared spectroscopy, thermal emission measurements



Please send your full CV

and three representative publications to: [zjacob@purdue.edu](mailto:zjacob@purdue.edu)

**Prof. Zubin Jacob**

**Birck Nanotechnology Center**

**School of Electrical and Computer Engineering**

**Purdue University, U.S.A.** [www.electrodynamics.org](http://www.electrodynamics.org)

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# About the group

Google Scholar Page: [https://scholar.google.ca/citations?user=8FXvN\\_EAAAJ&hl=en](https://scholar.google.ca/citations?user=8FXvN_EAAAJ&hl=en)

**Main Research Areas:** Casimir forces, quantum nanophotonics, plasmonics, metamaterials, Vacuum fluctuations, open quantum systems

Weblink: [www.electrodynamics.org](http://www.electrodynamics.org)

Twitter: [twitter.com/zjacob\\_group](https://twitter.com/zjacob_group)

## Major Breakthrough Papers:

**Science (2012)**

**Optica (2014)**

**Nature Nanotechnology (2016)**

**Nature Communications (2016)**

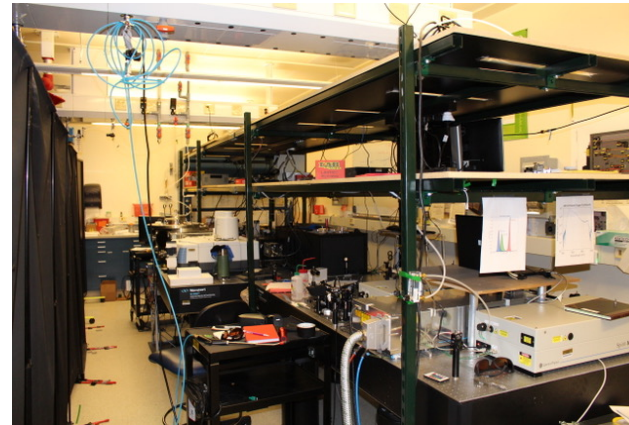
**Optica (2016)**

**Nature Communications (2017)**

Theory and Experiment

- Opportunity to closely interact with theorists and experimentalists within the group
- Opportunity to travel to conferences, workshops and collaborate with various groups around the world

Regular one-on-one meetings with group leader and team meetings



*Current laboratory is fully built and has over 700k USD optical equipment*

## Quantum Interactions

- Vacuum fluctuations
- Entanglement
- Single photon detectors

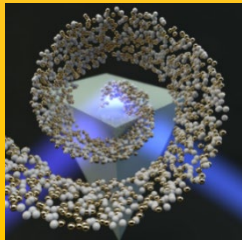


### Selected Publications

- [Nature Communications 8, 14144 \(2017\)](#)
- [Optics express 22 \(21\), 26193-26202 \(2014\)](#)

## Spin and Topology

- Spin-photonic interfaces
- Topological photonics

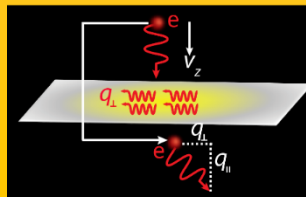


### Selected Publications

- [Optica 3 \(2\), 118-126 \(2016\)](#)
- [Appl. Phys. Lett. 108 \(6\) 061102 \(2016\)](#)

## Optical and Electron Imaging

- EELS
- TIRF



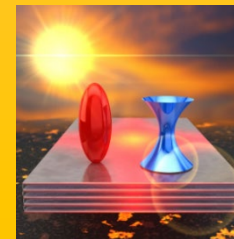
### Selected Publications

- [ACS Photonics, 4 \(4\), 1009-1014 \(2017\)](#)
- [Optics Letters 41 \(23\), 5499-5502 \(2016\)](#)

[www.electrodynamics.org](http://www.electrodynamics.org)

## Thermal Engineering

- Nanoscale radiative heat transfer
- High temperature thermal emission
- Thermal management

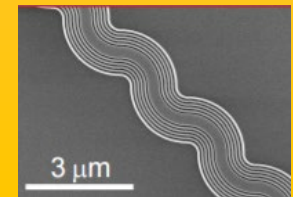


### Selected Publications

- [Nature Communications 7, 11809 \(2016\)](#)
- [Optics express 21 \(101\), A96-A110 \(2013\)](#)

## Devices/Fabrication

- On-chip photonic devices
- Large area nanofabrication



### Selected Publications

- [Nature nanotechnology 11 \(1\), 23-36 \(2016\)](#)
- [Optica 1 \(2\), 96-100 \(2014\)](#)

Research projects funded by DOD, NSF, DOE (close interactions with program managers and international collaborators )

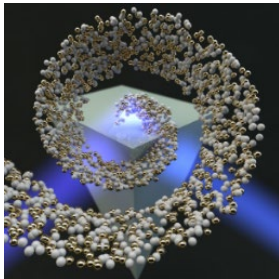
# Research Highlights

Subtle mix of theory, computational modeling, and experiment to advance fundamental knowledge on quantum/thermal light sources/detectors

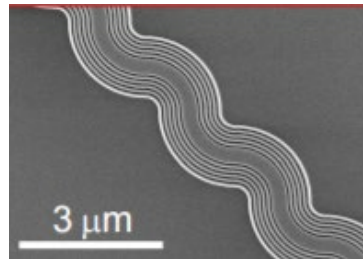
5 Most Significant Contributions led by students and post-docs from the group



Shown existence of Giant Vacuum Friction

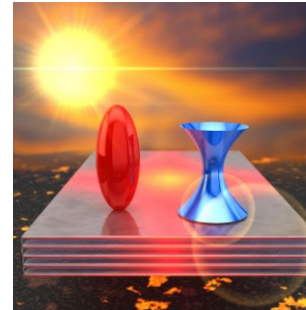


Discovered Universal Spin-Momentum Locking of Light



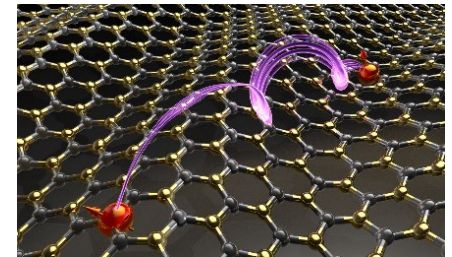
Proposed new Platform for Dense Photonic Integrated Circuits

Theory + Experiment



Foundational work on thermal metamaterials

Theory + Experiment



Introduced framework for engineering dipolar interactions

Theory + Experiment



# Purdue University

- School of Electrical and Computer Engineering at Purdue University is consistently ranked among the top 10 in the U.S.
- Purdue Engineering combines the perfect mix of fundamental science and application and is one of the most prestigious engineering schools in the world

The post-doctoral scholar will have his/her office in **Birck Nanotechnology Center** and interact with world-leading groups in multiple fields of research. The vibrant, dynamic and intellectually stimulating environment is ideal for a balance between theory and experiment.

Living in West-Lafayette or Lafayette, Indiana is affordable and fun. Diverse, multi-cultural student body and 2 hours from Chicago

