

NICOLAS C. PÉGARD, PH.D.

Department of Applied Physical Sciences
University of North Carolina at Chapel Hill
EDUCATION & TRAINING

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Ph.D. in Electrical Engineering *Princeton University, Princeton, NJ, 2009-2014*

Doctoral Research in optical system optimization, 3D optofluidic imaging.

Thesis: Computational methods for microfluidic microscopy and phase-space imaging.

Advisor: Prof. Jason W. Fleischer, Imaging Physics Lab. Electrical Engineering dpt.

M.A. Majors: solid state physics, nonlinear optics.

M.S. in Engineering and B.S. in Physics *École Polytechnique, France, 2006-2010*

M.S. Majors: opto-electronics, spintronics, materials science.

B.S. Majors: applied mathematics, quantum physics.

ACADEMIC & PROFESSIONAL APPOINTMENTS

Assistant Professor *University of North Carolina at Chapel Hill, NC, 2019-Present*

Department of Applied Physical Sciences, and department of Biomedical Engineering (affiliated)

Primary Faculty: UNC Neuroscience Center

Group leader : Computational Biophotonics Laboratory.

Research interests : Task-based optics, optimized instrumentation and computational methods for photonics applications beyond imaging, neurotechnology & biophotonics.

Postdoctoral Scholar *University of California, Berkeley, CA, 2014-2018*

Departments of Molecular & Cell Biology, and Electrical Engineering & Computer Science.

Advisors : Prof. Hillel Adesnik, Prof. Laura Waller.

Research interests : Instrumentation and computational methods for 3D *in vivo* holographic optogenetic photostimulation and optical tracking of neural activity.

SELECTED JOURNAL PUBLICATIONS

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| Precise multimodal optical control of neural ensemble activity | 2018 |
| <i>*A.Mardinly, *I. Oldenburg, *N. Pégard, et al.</i> | Nature Neuroscience, 21 , 881-893 |
| 3D Scanless Holographic Optogenetics with Temporal Focusing | 2017 |
| <i>*N. Pégard, *A. Mardinly, et al.</i> | Nature Communications, 8 , 1228 |
| 3D Computer Generated Holography by Nonconvex Optimization | 2017 |
| <i>*J.Zhang, *N. Pégard, J.Zhong, and L.Waller (*Equal contributors)</i> | Optica, 4 , 1306-1313 |
| Compressive light-field microscopy for 3D neural activity recording [†] | 2016 |
| <i>N. Pégard, H-Y. Liu, N. Antipa, M. Gerlock, H. Adesnik, and L. Waller</i> | Optica, 3 , 517-524 |
| Flow-scanning optical tomography [†] | 2014 |
| <i>N. Pégard, M.Toth, M.Driscoll, and J. W. Fleischer</i> | Lab-on-a-Chip, 14 , 4447-4450 |
| [†] Classified as “Hot article” due to receiving particularly high scores at peer review. | |
| Wrinkles and deep folds as photonic structures in photovoltaics | 2012 |
| <i>*J-B. Kim, *P. Kim, *N. Pégard, et al. (*Equal contributors)</i> | Nature Photonics, 6 , 327-332 |
| Optimizing holographic data storage using a Fractional Fourier Transform | 2011 |
| <i>N. Pégard, and J. W. Fleischer</i> | Optics Letters, 36 , 2551-2553 |

SELECTED PATENTS

3D Sparse Holographic Temporal focusing (Licensing in progress withy 3I Inc.)	2016
<i>L. Waller, N. Pégard, and H. Adesnik</i>	Patent Application 62-429/017
Compressive plenoptic microscopy	2015
<i>L. Waller, N. Pégard, and H. Adesnik</i>	Provisional Patent Application 62-188/626

SELECTED HONORS & AWARDS

Career Award at the Scientific Interface (CASI)	<i>Burroughs Wellcome Fund</i> , 2018
Outstanding postdoc research award, MCB Department	<i>U.C. Berkeley</i> , 2017
Harold Dodds honorific fellowship (dissertation funding)	<i>Princeton University</i> , 2013
Best research talk, 1 st place	<i>Princeton University Research Symposium</i> , 2013
Outstanding Teaching Assistant award, Engineering Department	<i>Princeton University</i> , 2010
Gordon Y.S. Wu fellowship for engineering (doctoral funding)	<i>Princeton University</i> , 2009

SERVICE & OUTREACH IN RESEARCH AND EDUCATION

President <i>Sculpted Light in the Brain Association</i> (www.sculptedlight.org)	2018-Present
A non-profit association to promote research at the interface of optics and neuroscience.	
Conference chair and organizer <i>Sculpted Light in the Brain</i>	2017-Present
at the Royal Society, London (2019), \$80k sponsorship raised & NIH R13 funding.	
at UC Berkeley (2017), \$20k sponsorship raised, 11 invited speakers, 35 posters, 250 attendees.	
Session chair	2017-2018
<i>Multidimensional Microscopy conference, SPIE Photonics West 2017.</i>	
<i>Advanced Imaging Methods (AIM) Workshop, University of California Berkeley 2018.</i>	
Technical group leader <i>Optical Biosensors</i> (<i>Optical Society of America</i>)	2017-2018
Scientific Reviewer	2012-Present
<i>Nature, Nature Photonics, Nature Communications, Scientific reports, IEEE Transactions on Signal Processing, Applied Optics, JOSAA, Biomedical Optics Express, Optica, Optics letters, Optics Express, MIT Press, National Natural Science Foundation of China.</i>	

TEACHING EXPERIENCE

Assistant Professor, University of North Carolina at Chapel Hill	2019
APPL 425 Optical Instrumentation for Scientists and Engineers. (New course design)	
Invited lecturer, University of California, Berkeley	2014-2017
<i>Introduction to Optical Engineering, Lasers</i> (EE 118), <i>Diffraction</i> (EE 218A), <i>Recording neural activity in 3D with compressive light field microscopy, Neurotech/BMI class</i> (EE290P)	
Teaching assistant, Princeton University	2010-2013

OTHER WORK EXPERIENCE & SKILLS

Engineering research consultant	2016-Present
Nodexus Inc. Berkeley, CA (2016), 3I Intelligent Systems Inc. Denver, CO. (2019)	
Junior navigation officer, Midshipman rank, (M649 Persée) French navy.	2006
Languages: French (native speaker), English (fluent), German (fluent), Russian (beginner).	