Lamiae Abdeladim, PhD

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Education

2015–2018 **PhD in Physics/Optics**, *Paris-Saclay University/Ecole polytechnique*, Palaiseau

Oct2017–Nov2017 **'Development and Plasticity of the Nervous System' course**, *Inst. Pasteur*, Paris
5-week Intensive theoretical and practical neurobiology course.

2011–2014 **Masters Degree in Optics/Photonics**, *Paris-Saclay University/IOGS*, Palaiseau

2011–2014 **Masters Degree in Physical Chemistry**, *PSL University/ESPCI Paris*, Paris

2008–2011 **Intensive undergraduate Maths and Physics program to prepare for competitive entrance to French 'Grandes Ecoles' engineering schools**, *Lycée Saint-Louis*, Paris

Research experience (graduate/post-graduate)

2019- **Postdoctoral fellow at University of California Berkeley, MCB**

Advisor Prof. Hillel Adesnik.

Fast high-throughput all-optical interrogation of cortical circuits. Development of a high-speed full volumetric neural read/write optical interface with cellular resolution and millisecond precision control throught the combination of 2P Bessel beam imaging and 3D temporally-focused holography.

Large-scale interareal all-optical interrogation of cortical circuits Development of a mesoscale holographic microscope to investigate how top-down projections from higher visual areas drive computation in primary visual cortex.

2015-2018 **PhD candidate at Ecole polytechnique, Laboratory for Optics and Biosciences**

Advisors Dr. Emmanuel Beaurepaire, Dr. Jean Livet and Dr. Willy Supatto.

Large volume multicolor multiphoton microscopy of cerebral tissues. Development of large-volume multicolor multiphoton microscopy based on the combination of wavelength mixing and automated serial tissue sectioning. Applications to cell morphometry, lineage and circuit analysis. Development of dual-color deep-tissue three-photon microscopy.

Preprints

[2] H.Shin, MB. Ogando, **L.Abdeladim**, S. Durand, H. Belski, H. Cabasco, H. Loefler, A. Bawany, B. Hardcastle, J. Wilkes, K. Nguyen, L. Suarez, T. Johnson, W. Han, B. Ouellette, C. Grasso, J. Swapp, V. Ha, A. Young, S. Caldejon, A. Williford, P. Groblewski, S. Olsen, C. Kiselycznyk, J. Lecoq, H. Adesnik *Recurrent pattern completion drives the neocortical representation of sensory inference*. **BiorXiv**,2023

[1] **L.Abdeladim***, H.Shin*, U. Jagadisan* (equally contributed), MB. Ogando, H. Adesnik *Probing inter-areal hierarchical visual computations with a cellular resolution two-photon holography mesoscope*. **BiorXiv**,2023

Selected publications

[9] S.Sridharan*, M.Gajowa*, MB.Ogando*, Uday Jagadisan* (equally contributed), **L.Abdeladim**, M.Sadahiro, H.Bounds, WD.Hendricks, TS. Turney, K.Gopakumar, I.Tayler, IA.Oldenburg, SG. Brohawn, H. Adesnik *High performance microbial opsins for spatially and temporally precise perturbations of large neuronal networks*. **Neuron**, 2022

[8] H.Adesnik and **L.Abdeladim**. *Probing neural codes with two-photon holographic optogenetics*. **Nature Neuroscience**, 2021

[7] V.Maioli, A.Boniface, P.Mahou, J. Ferrer Ortas **L.Abdeladim**, E.Beaurepaire, W.Supatto. *Fast in vivo multiphoton light-sheet microscopy with optimal pulse frequency*. **Biomedical optics express**, 2020

[6] S.Clavreul, **L.Abdeladim**, E.Hernandez-Garzon, D.Nicolescu, J.Durand, S.H.Leng, R.Barry, R.Benosman, G.Bonvento, E.Beaurepaire, J.Livet and K.Loulier. *Cortical astrocytes develop in a plastic manner at both clonal and cellular levels*. **Nature Communications**, 2019

[5] **L.Abdeladim**, K.S.Matho, S.Clavreul, P.Mahou, J-M.Sintes, X.Solinas, I.Arganda-Carreras, S.G.Turney, J.W.Lichtman, A-P.Bemelmans, K.Loulier, W.Supatto, J.Livet and E.Beaurepaire. *Multicolor multiscale brain imaging with chromatic serial multiphoton microscopy*. **Nature Communications**, 2019.

Article highlighted in Nature Methods, June 2019 in the Methods In brief section.

[4] K.Guesmi*, **L.Abdeladim*** (equally contributed), S.Tozer, P.Mahou, T.Kumamoto, K.Jurkus, P.Rigaud, K.Loulier, N.Dray, P.Georges, M.Hanna, J.Livet, W.Supatto, E.Beaurepaire and F.Druon. *Dual-color deep-tissue three-photon microscopy with a multiband infrared laser*. **Light : Science and Applications**, 2018

Article selected among the most notable peer-reviewed work in 2018 in the field of Optics by the OSA journal Optics & Photonics News.

[3] C.Stringari, **L.Abdeladim**, G.Malkinson, P.Mahou, X.Solinas, I.Lamarre, S.Brizion, J-B.Galey, W.Supatto, R.Legouis, A-M.Pena and E.Beaurepaire. *Multicolor two-photon imaging of endogenous fluorophores in living tissues by wavelength mixing*. **Scientific Reports**, 2017

[2] P.Cadroas, **L.Abdeladim**, L.Kotov, M.Likhachev, D.Lipatov, D.Gaponov, A.Hideur, M.Tang, J.Livet, W.Supatto, E.Beaurepaire and S.Février. *All-fiber femtosecond laser providing 9nJ, 50MHz pulses at 1650 nm for three-photon microscopy* . **Journal of Optics**, 2017

[1] S.Aknoun, J.Savatier, P.Bon, F.Galland, **L.Abdeladim**, B.F.Wattellier and S.Monneret. *Living cell dry mass measurement using quantitative phase imaging with quadriwave lateral shearing interferometry : an accuracy and sensitivity discussion*. **Journal of Biomedical Optics**, 2015

Patents

Multiphotonic microscopy method and Device, Publication number 20200088642

F.Druon, M.Hanna, P.Rigaud, K.Guesmi E.Beaurepaire,, W.Supatto, P.Mahou, L.Abdeladim.

Awards and Fellowships

2023 Wellcome Burrough Career Award at the Scientific Interface finalist

2022 Brain Initiative Trainee Highlight Award

2020 LSRF2019 postdoctoral fellow finalist

2020 Marie-Curie global fellowship (MSCA-GF) awarded (score 98.4/100, declined)

2019 Ecole Polytechnique Interface doctoral school thesis prize

2018 Best poster prize at the OSA Biophotonics Congress 2018, Hollywood, Florida

2018 Paris-Saclay University Physics Department (PhOM) thesis prize

2016 Best poster prize at Physics and Biological Systems 2016, Palaiseau, France

2015-2017 IDEX Paris-Saclay PhD 3-year fellowship

2008-2013 AEFE Excellence-Major fellow (competitive fellowship from French Foreign Ministry of Affairs to pursue higher education in France)

Service and Outreach

2020- Independent reviewer for peer-reviewed optics and interdisciplinary journals Nature Methods, Biomedical Optics Express, Optics Express, Optics Letters, Optica

2019- Managing Anneslist, a website highlighting female neuroscientists

2019- Member of the Sculpted Light in the Brain 2022 conference organizing committee

2016 Member of the student organizing committee at Physics and Biological Systems 2016

2015-2018 Animations, conferences, laboratory visits for the general public, kids and teenage girls from underrepresented backgrounds (Fête de la Science at l'Ecole polytechnique 2015-2018, Pint of Science 2018, Animath Journée pour les Femmes et les Mathématiques).

Teaching experience

Ecole polytechnique, Palaiseau

2015-2017 In charge of **Experimental Physics practicals**, for bachelor and masters students. Modules: '*Femtosecond lasers*' and '*Linear and Nonlinear optics*'

2016-2017 Co-advised bachelor students for the participation to the International Physics Tournament 2017. The team ended up 3rd/18 at the finals held in April 2017, Gothenburg, Sweden

Presentations at International conferences

Talk *Chromatic serial multiphoton microscopy for high-content multiscale analysis of large brain volumes*. L.Abdeladim, K.S.Matho, S.Clavreul, P.Mahou, J-M.Sintes, X.Solinas, I.Arganda-Carreras, S.G.Turney, J.W.Lichtman, A-P.Bemelmans, K.Loulier, W.Supatto, J.Livet and E.Beaurepaire. **OSA Biophotonics Congress, 2019 Tucson, Arizona.**

Talk (post-deadline) *Dual-color three-photon microscopy of neural tissue using a multiband MHz OPA*. L.Abdeladim, K.Guesmi, P.Mahou, S.Tozer, T.Kumamoto, J.Ferrer-Ortas, N.Dray, K.Loulier, M.Hanna, P.Georges, J.Livet, W.Supatto, F.Druon and E.Beaurepaire. **OSA Biophotonics Congress, 2018 Fort Lauderdale, Florida.**

Talk *Multicolor two-photon imaging of endogenous fluorophores in living tissues by wavelength mixing*. C.Stringari, L.Abdeladim, P.Mahou, G.Malkinson, S.Brizion, J-B.Galey, W.Supatto, R.Legouis, A-M.Pena and E.Beaurepaire. **OSA Biophotonics Congress, 2018 Fort Lauderdale, Florida.**

Talk *Volumetric multicolor multiphoton microscopy for neuron connectivity and cell lineage analysis*. L.Abdeladim, K.Matho, N.Vuillemin, S.Clavreul, P.Mahou, A.Chessel, X.Morin, K.Loulier, W.Supatto, J.livet and E.Beaurepaire. **OSA Optics and the Brain, 2017 San Diego, California.**

Talk *Volumetric and multicolor multiphoton microscopy: Application to neuron connectivity, cell lineage analysis and metabolic tissue imaging*. L.Abdeladim, K.Matho, C.Stringari, N.Vuillemin, P.Mahou, S.Clavreul, A.Chessel, K.Loulier, W.Supatto, J.Livet, and E.Beaurepaire **Focus On Microscopy, 2017 Bordeaux.**

Poster *High-speed three-dimensional interrogation of neural circuits with single-cell and single-spike precision*. L.Abdeladim, A.Pasarkar, S. Sridharan, M. Ogando, W. Hendricks, I. Kinsella, N.Ji, L. Paninski and H. Adesnik **Sculpted Light in the Brain, 2022 Boston, Massachussets.**

Poster (best poster prize award) *Dual-color 3-photon microscopy for deep imaging of neural tissue*. L.Abdeladim, K.Guesmi, P.Mahou, S.Tozer, T.Kumamoto, J.Ferrer-Ortas, N.Dray, K.Loulier, M.Hanna, P.Georges, J.Livet, W.Supatto, F.Druon and E.Beaurepaire. **OSA Biophotonics Congress, 2018 Fort Lauderdale, Florida.**

Poster (best posterprize award) *Large volume Brainbow-labeled tissue imaging using multicolor multiphoton microscopy*. L.Abdeladim, N.Vuillemin, K.Matho, P.Mahou, S.Clavreul, J-M.Sintes, X.Solinas, A.Chessel, X.Morin, K.Loulier, W.Supatto, J.Livet and E.Beaurepaire. **Physics and Biological systems, 2016 Palaiseau.**

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