# Alexandros Tavernarakis

*Curriculum Vitæ*

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## Key words

Physics, Quantum optics, Interferometry, Metrology, Telemetry, Microscopy, Sensing applications, Laser physics, Precision measurements, Nanoptomechanics, Nanofabrication.

## Skills

- Advanced skills in **experimental optics**: quantum-noise limited laser sources, homodyne/balanced detections, ultra-sensitive interferometric techniques, laser stabilization.
- Advanced skills in **analogue electronics and closed-loop systems**. Feedback control loops, ultra-sensitive photodiode amplifiers. Familiar with nanoelectromechanical measurement techniques.
- Advanced theoretical knowledge of **quantum mechanics/quantum optics**.
- Familiar with **nanofabrication techniques**: electron beam lithography, scanning electron microscopy, carbon nanotubes CVD growth, suspended graphene resonators.
- **Computer skills**:

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| Programming | Matlab, Python, Mathematica, Fortran, C, LabView, Zemax, LaTeX. |
| Graphic tools | Corel Draw, Adobe Illustrator, Inkscape, Cinema 4D, Blender. |
| Op. Systems | Linux, OS X, Windows. |

- **Leadership skills**: supervision of 3 Master and 4 PhD students.
- **Social skills**: rapid adaptation to new environments (Heraklion-Greece, Grenoble-France, Lyon-France, Paris-France, Barcelona-Spain, Athens-Greece), eager to collaborate with other people.

## Professional experience/projects

2021 - .. **Research and Development - Project management**, *Eight Bells*, Athens, Greece.
Project management, proposal preparation.

2018 - 2021 **Research and Development engineer**, *Raymetrics | NOA*, Athens, Greece.
Product development, proof-of-concept research, project management, data analysis

2018 **Optical engineer**, *Fasmatech*, Athens, Greece.
Development of a fluorescent microscope for mass spectrometry applications.

2016 **Research fellow**, *ICFO | PI: Adrian Bachtold*, Barcelona, Spain.
**Nanooptomechanics** and **nanoelectromechanics** development of novel measurements techniques of carbon nanotube-based resonators using a focused laser beam or electron beam.

2013 – 2015 **Post-doctoral internship**, *ICFO | PI: Adrian Bachtold*, Barcelona, Spain.
**Nanooptomechanics and mass sensing** using SiC nanowires, graphene and carbon nanotubes resonators.

2011 – 2012 **Temporary Research Assistant**, *Ecole Normale Superieure de Paris*, France.
Experimental quantum optics. Supervisor of the third-year undergraduate module "Projets experimentaux".

2008 – 2011 **PhD**, *Kastler Brossel Laboratory | ENS | UPMC | CNRS*, Paris, France.
Development of a state-of-the-art, quantum-optics, experiment capable of observing quantum measurements back-action signatures.
Supervisor: Antoine Heidmann

2008 – 2011 **Teaching assistant**, *Pierre and Marie Curie University*, Paris, France.
Teaching first-year (L1) undergraduate students.

2008 **Research internship**, *Kastler Brossel Laboratory*, Paris, France.
Optomechanical phase-intensity correlations: towards the quantum regime.
Supervisor: Antoine Heidmann

2007 **Research internship**, *IESL-Forth*, Heraklion, Greece.
A quantum random number generator based on spin-noise.
Supervisors: Iannis Kominis, Giorgos Katsoprinakis

2005 **Research internship**, *IESL-Forth*, Heraklion, Greece.
Design and construction of a Michelson wavemeter.
Supervisor: Iannis Kominis

## Education

2021 – ... **Master**, *National Kapodistrean University of Athens*, Greece.
Big Data and Artificial Intelligence.

2007 – 2008 **Master 2**, *Pierre and Marie Curie University*, Paris France.
Experimental atomic and molecular physics.

2006 – 2007 **Master 1**, *Ecole Normale Superieure de Lyon*, Paris France.
Sciences de la matière, Physics.

2004 **Erasmus internship**, *Institut National Polytechnique de Grenoble*, Grenoble, France.
Physics

2000 – 2005 **Physics Diploma**, *University of Crete*, Heraklion, Greece, .
Physics

2000 **High School Diploma**, *2nd Liceum of Pefki*, Athens, Greece, .
Orientation: sciences

## International conferences

- GdR MecaQ 2nd annual meeting, Paris 2017 (oral)
- Journées de la Matière Condensée, Bordeaux 2016 (oral).
- Cleo US, San Jose, California 2016 (oral and poster)
- Cleo/Europe - EQEC, Munich 2015 (oral)
- Quantum Phononics: from Transport and Optomechanics to Quantum Biology, Heraklion 2015 (oral)
- Journées de la Matière Condensée, Paris 2014 (oral).
- 11th International Workshop on Nanomechanical Sensing May 2014, Madrid, Spain (oral).
- 28th International Winterschool on Electronic Properties of Novel Materials, March 2014, Austria.
- Frontiers of Nanomechanics, 9-13 September 2013, Trieste, Italy.

- CLEO/EUROPE - IQEC 2012, May 2012, Munich, Germany.
- GRC: Mechanical Systems in the Quantum Regime, March 21-26 2010, Galveston, USA.

## References


**Antoine Heidmann** *antoine.heidmann@spectro.jussieu.fr, +33 1 44 27 43 89.*

**Adrian Bachtold** *adrian.bachtold@icfo.es, +34 9 35 54 22 39.*

**Iannis Kominis** *ikominis@physics.uoc.gr, +30 2810 39 42 23.*


## Publications


G. Gruber, C. Urgell, A. Tavernarakis, A. Stavrinadis, S. Tepsic, C. Magen, S. Sangiao, J. M. De Teresa, P. Verlot, and A. Bachtold, "Mass sensing for the advanced fabrication of nanomechanical resonators," *Nano letters*, vol. 19, no. 10, pp. 6987–6992, 2019.

J. Schwender, I. Tsioutsios, A. Tavernarakis, Q. Dong, Y. Jin, U. Staufer, and A. Bachtold, "Improving the read-out of the resonance frequency of nanotube mechanical resonators," *Applied Physics Letters*, vol. 113, no. 6, p. 063104, 2018.

A. Tavernarakis, A. Stavrinadis, A. Nowak, I. Tsioutsios, A. Bachtold, and P. Verlot, "Optomechanics with a hybrid carbon nanotube resonator," *Nature communications*, vol. 9, no. 1, p. 662, 2018.

I. Tsioutsios, A. Tavernarakis, J. Osmond, P. Verlot, and A. Bachtold, "Real-time measurement of nanotube resonator fluctuations in an electron microscope," *Nano Letters*, vol. 17, no. 3, 2017.

A. Tavernarakis, J. Chaste, A. Eichler, G. Ceballos, M. C. Gordillo, J. Boronat, and A. Bachtold, "Atomic monolayer deposition on the surface of nanotube mechanical resonators," *Physical review letters*, vol. 112, no. 19, p. 196103, 2014.

P. Verlot, A. Tavernarakis, T. Briant, P. F. Cohadon, and A. Heidmann, "Backaction Amplification and Quantum Limits in Optomechanical Measurements," *Physical Review Letters*, vol. 104, p. 133602, Mar. 2010.

P. Verlot, A. Tavernarakis, T. Briant, P. F. Cohadon, and A. Heidmann, "Scheme to Probe Optomechanical Correlations between Two Optical Beams Down to the Quantum Level," *Physical Review Letters*, vol. 102, p. 103601, Mar. 2009.

G. Katsoprinakis, M. Polis, A. Tavernarakis, A. Dellis, and I. K. Kominis, "Quantum random number generator based on spin noise," *Physical Review A*, vol. 77, p. 054101, May 2008.


## Languages

Greek **Native**

French **Native**

English **Fluent**

Spanish **Fluent**