JÉRÔME DEGALLAIX

Laboratoire des Matériaux Avancés (LMA)
Institut de Physique des 2 infinis de Lyon (IP2I)
7 Avenue Pierre de Coubertin
69100 Villeurbanne
France

+33 (0)4-72-43-26-69
j.degallaix@lma.in2p3.fr

Present position **CNRS permanent researcher** **since Oct. 2012**
Laboratoire des Matériaux Avancés / IP2I

Research Interests *Gravitational wave detection*: Optical simulations of the performances of laser gravitational wave detectors. Development of optical simulation code to include realistic optical distortions and help to design and commissioned laser interferometers. Participation to the commissioning of the Virgo detector. Supervising the optical design of the Einstein Telescope.
Materials research: development of optical characterisation benches at room or cryogenic temperatures. Research on sapphire growth and polishing for cryogenic mirrors.

Current responsibilities

LMA Virgo group leader **since Feb. 2018**
As the group leader I am member of the Virgo Steering Committee. I manage the 20 members of the Virgo group at LMA and IP2I. PI of the group for the VirgoLab.

Coordinator of the optical characterisation of Advanced Virgo. since Sep. 2015
Manage the operations on the Virgo site to measure in-situ the optical properties of the optical cavities. I also serve several weeks per year as the Weekly Commissioning Coordinator, directing the operations in the control room of Virgo.

Scientific coordinator for research projects.
Responsible for several collaborative projects: SEPO450 funded by the region AURA on the growth and characterization of large sapphire substrates, IN2P3 Master Project DOPAL on sapphire polishing. Projects on quantum optics coordinated by the LKB (Paris).

Education

Ph.D. in Physics, University of Western Australia – Perth, Australia **Jan. 2006**
Master degree in astrophysics, Institut d'Astrophysique de Paris (IAP), France **Sep. 2002**
Engineering degree in photonics, École Nationale Supérieure des Sciences Appliquées et de Technologie (ENSSAT), France. **Sep. 2001**

Past Research Experience and positions

Subsystem manager OSD for Advanced Virgo. Oct 2011 - Dec 2016
OSD stands for Optical Simulation and Design, this subsystem has the responsibility of the optical design of Advanced Virgo and the development and management of the optical simulation tools. During the peak activity, there was a group of 6 people dedicated to this task. My role ended at the end of the project, when Advanced Virgo has reached its operating point.

Junior researcher at Albert Einstein Institute. Feb 2007 - March 2010
Working in Hannover (Germany) at the commissioning of the GEO600 gravitational

waves interferometer and on the installation of its successor GEO-HF. Design and construction of the GEO-HF output mode cleaner.

Prizes

Special Breakthrough Prize In Fundamental Physics **2016**

Gruber Cosmology prize **2016**

Selected publications

I have more than 40 publications in peer-review journals about optical cavities and optical materials. I am also co-author of more than 100 publications regarding the astrophysical results from gravitational wave detectors.

J. Degallaix, C.Zhao, L. Ju and D. Blair, "Simulation of bulk absorption thermal lensing in transmissive optics of gravitational waves detectors", *Applied Physics B* (2003), Vol 77, p 409- 414

J. Degallaix, C.Zhao, L. Ju and D. Blair, "Thermal lensing compensation for AIGO high optical power test facility", *Classical and Quantum Gravity* (2004), Vol 21, S903

J. Degallaix, C.Zhao, L. Ju and D. Blair, "Thermal tuning of optical cavities for parametric instability control", *Journal of the Optical Society of America B* (2007), Vol 24, p 1336-1343

J. Degallaix, R. Flaminio, D. Forest et al. "Bulk optical absorption of high resistivity silicon at 1550 nm" *Optics Letters*, vol 38. N°12 (2013) 2047-2049.

J. Degallaix, J. Komma , D. Forest et al. "Measurement of the optical absorption of bulk silicon at cryogenic temperature and the implication for the Einstein Telescope" *Classical and Quantum Gravity* (2014) vol. 31, no 18, p. 185010.

J. Degallaix et al. "Large and extremely low loss: the unique challenges of gravitational wave mirrors." *JOSA A* (2019), 36.11 : C85-C94.

J. Degallaix "OSCAR: A MATLAB based package to simulate realistic optical cavities." *SoftwareX* (2020), 12:100587.

N. Gutierrez, **J. Degallaix** et al. "Optical characterization of high performance mirrors based on cavity ringdown time measurements with 6 degrees of freedom mirror positioning" *Review of Scientific Instruments* (2023) Oct 1;94(10).

M. Le Jean, **J Degallaix** et al. "Comparison of arm cavity optical losses for the two wavelengths of the Einstein Telescope gravitational wave detector." *Classical and Quantum Gravity* 41.22 (2024): 225004.