Kélian Sommer

PhD Student · CNRS/IN2P3

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Education

University of Montpellier - CNRS/IN2P3 *Montpellier*

PhD, Physics *2021 - present*

- Supervisors: Dr. Eric NUSS, Dr. Bertrand PLEZ, Dr. Johann COHEN-TANUGI
- Subject: **High-precision photometry in the era of ZTF and LSST cosmological surveys : characterization of instrumental and atmospheric transmissions**
- Involvement in the StarDICE metrology experiment for the Photometric Calibration Working Group (PCWG) and the Dark Energy Science Collaboration (DESC)
- Development, calibration and operation of an uncooled infrared thermal camera for sky radiance measurements to improve photometric observations quality
- Advanced data reduction, signal processing and image analysis in infrared thermography and optical photometry
- Leading observations and scientific data acquisition at Observatoire de Haute-Provence
- Design and prototyping of a transportable instrument capable of measuring telescope throughput at sub-percent uncertainty level in the context of Zwicky Transient Facility (ZTF)

ESTACA Engineering School *Paris/Saclay*

Master of aerospace engineering *2016 - 2021*

- Preparatory class (2016-2018)
- Launchers : propulsion systems, aerodynamics, operations
- Satellites : orbital mechanics, Guidance Navigation & Control (GNC), mechanical, thermal and electrical architecture
- Embedded systems : Real-Time Operating Systems (RTOS), microcontroller programming, sensors and actuators
- School research project : development of an autonomous, connected and embedded system which can measure air pollutants in big cities and display data to population in real time (involving sensors calibration, data acquisition, programming embedded systems)
- Master's thesis project : Conceptual design and analysis of Manned Orbital Vehicle for Ariane 6 next generation launcher

Paris Observatory *Remote*

University diploma *2019 - 2021*

- Fundamentals for astrophysics (Graduate level)
- Instrumentation, measuring chain and projects (Master level)

Sorbonne Faculty of Science and Engineering *Remote*

Graduate level teaching units *2019 - 2020*

- Quantum mechanics
- Electromagnetism and optics

Lycée Henri Meck *Molsheim*

Baccalaureate in Sciences *2016*

- Very high honors
- Specialized in mathematics

Professional Experience

2021 **Master's of engineering final year internship**, Laboratoire Univers et Particules de Montpellier (CNRS/IN2P3)

2020 **Instrument engineer internship**, Center for Particle Physics of Marseille (CNRS/IN2P3)

2019 **Summmer job as warehouse and order picker**, Zalando Logisitics Sud SE CO. KG

2018 **Assistant engineer internship in aeronautics**, Safran Landing Systems

2017 **Summer job as production operator in electrical industry**, Socomec

Publications

Published

M. Betoule, S. Antier, E. Bertin, P. E. Blanc, S. Bongard, J. Cohen-Tanugi, S. Dagoret-Campagne, F. Feinstein, D. Hardin, C. Juramy, L. Le Guillou, A. Le Van Suu, M. Moniez, J. Neveu, E. Nuss, B. Plez, N. Regnault, E. Sepulveda, **K. Sommer**, T. Souverin. **StarDICE I. Sensor calibration bench and absolute photometric calibration of a Sony IMX411 sensor**. Astronomy & Astrophysics. 2023

In Review

B. Carreres, J. E. Bautista, F. Feinstein, D. Fouchez, B. Racine, M. Smith, M. Amenouche, M. Aubert, S. Dhawan, M. Ginolin, A. Goobar, P. Gris, L. Lacroix, E. Nuss, N. Regnault, M. Rigault, E. Robert, P. Rosnet, **K. Sommer**, R. Dekany, S. L. Groom, N. Sravan, F. J. Masci, J. Purdum. **Growth-rate measurement with type-Ia supernovae using ZTF survey simulations**. Astronomy & Astrophysics. 2023

In Prep

K. Sommer, J. Cohen-Tanugi, E. Nuss, B. Plez, M. Betoule, L. Le Guillou, S. Bongard, T. Souverin, J. Neveu, E. Sepulveda. **Design and performance assessment of a Collimated Beam Projector using a broadband light source**. Astronomy & Astrophysics

K. Sommer, J. Cohen-Tanugi, E. Nuss, B. Plez, M. Moniez, S. Dagoret-Campagne, M. Betoule, L. Le Guillou, S. Bongard, T. Souverin, J. Neveu, E. Sepulveda. **Calibration of an uncooled LWIR thermal camera for cirrus cloud detection in astronomy**. Astronomy & Astrophysics

Teaching Experience

Fall 2022 **Master students observational astrophysics project**, Teaching Assistant — *Observatoire de Haute-Provence (CNRS)*

Others

Service and Outreach

- Collaboration member : DESC, LSST-France, ZTF
- Associations member : Société Française d'Astronomie et d'Astrophysique (SF2A) and Société Française d'Astronomie (SAF)

Research interests

- Instrumentation for observational cosmology
- Type 1a supernovae cosmology
- Long-wave infrared detector development and exploitation
- Calibration of high-sensivity instruments and data analysis for cosmology

Technical skills

- Software/langages : Python, C/C++, Arduino, Linux, Git
- CAD : Catia, Solidworks, FreeCAD
- Media : LaTeX, Adobe Creative Cloud

Languages

- French (native)

- English (fluent)
- Spanish and german (basic)

Hobbies and sports

- Amateur astrophotography and visual astronomy
- Cycling, running, hiking
- 3D printing, programming