

ALEXIS YEE SHAN LAU

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<https://alexisyslau.github.io/>

EDUCATION

Laboratoire d'Astrophysique de Marseille (LAM), France

Oct 2020 - Dec 2023

PhD in Optique, Photonique et Traitement d'image. Thesis title: "PSF Estimation and Deconvolution of Hyper-spectroscopic Data"

Supervisors: Benoit Neichel, Romain Fetick, Thierry Fusco, Olivier Beltramo-Martin

University of Exeter, UK

Sep 2016 - Jul 2020

MPhys Physics with astrophysics, First Class Honours

RESEARCH EXPERIENCE

PSF Estimation and Deconvolution

Oct 2020 - Dec 2023

PhD

Laboratoire d'Astrophysique de Marseille (LAM)

- Fine analysis of AO images deconvolution
- Optimisation of PSF estimation process from science images
- Generalisation to hyper-spectral data
- Application to solar system observations

Direct Imaging of Exoplanets and Circumstellar Disks

May 2018 - June 2020

Masters' Thesis, researcher

University of Exeter

- Analysed H, K and L band data from W.M. Keck Observatory
- Developed and Applied a pipeline for automated data analysis and candidates search
- Performed photometric and astrometric analysis of candidates

How magnetic geometries influences the amount of open flux

Jun - Sep 2019

Researcher

University of Exeter

- Built magnetic field geometries by mixing higher order of modes with dipole and implemented to existing magneto-hydrodynamics model
- Created a pipeline in Python for extracting and analysing data from simulations of stellar wind

SKILLS

Technical

Python, C, IDL, SQL, Matlab, Octave, Git, Latex, conda

Languages

Native: Cantonese, English, Mandarin; Basic: French

PUBLICATIONS

Peer Reviewed

Lau, A., Fetick, R., Neichel, B. , Beltramo-Martin O., Fusco, T. 'Improved Prior for Adaptive Optics Point Spread Function Estimation from Science Images: Application for Deconvolution.' Astronomy Astrophysics (accepted)

Hinkley, S., et al (including **Alexis Lau**), "[Discovery of an Edge-on Circumstellar Debris Disk around BD+45° 598: A Newly Identified Member of the \$\beta\$ Pictoris Moving Group](#)", The Astrophysical Journal.

Non Peer reviewed

Lau, A., Fetick, R., Neichel, B. , Beltramo-Martin O., Fusco, T. "[Towards robust deconvolution of hyperspectral data cubes](#)", Proc. SPIE 12185, Adaptive Optics Systems VIII

Muslimov, E., et al (including **Alexis Lau**), "[Current status of PAPHYRUS: the pyramid based adaptive optics system at LAM/OHP](#)", Optical Instrument Science, Technology, and Applications II, 2021, vol. 11876.

CONFERENCES AND WORKSHOPS

SPIE Astronomical Instrumentation (Poster presentation), 2022
NYRIA Workshop (Talk), 2021, 2022
[AO4ASTRO2](#) (Talk), 2021
[Spatially Resolved Spectroscopy with Extremely Large Telescopes](#) (Talk), 2021
European Adaptive Optics Summer School, 2021
ESCAPE Summer School, 2021
LAM High Angular Resolution Summer School, 2020

COMMUNITY SERVICES

Seminar organising committee at Laboratoire d'Astrophysique de Marseille 2022
[NYRIA](#) workshop organising committee 2022, 2023 (main-organiser)

ACADEMIC, TEACHING AND OUTREACH EXPERIENCES

Teaching Experience

Univeristy of Exeter May 2020 – June 2020

- Supervised master students to get started with the direct imaging survey

Laboratoire d'Astrophysique de Marseille (LAM)

June 2023 – Aug 2023

- Will supervise a master student to work on AO image deconvolution

Outreach Experience

SpaceExe, University of Exeter (Sep 2016 – 2020)

- Local Organising Committee of "Space:Exe Space Science and Astronomy Conference" (2018, 2019, 2020)
- Organising and managing scientific projects, e.g. XRT-C, an awarded students' project for building a 4.5m radio telescope in Cornwall
- Participating in the local Science Festivals and Organising community stargazing events
- Speaker of "Space:Exe Space Science and Astronomy Conference" (2018, 2019)

REFERENCES

Dr Benoit Neichel

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Laboratoire d'Astrophysique de Marseille (LAM)

Dr Romain Feticck

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Laboratoire d'Astrophysique de Marseille (LAM), ONERA

Prof Sasha Hinkley

Master project supervisor

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University of Exeter