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)*

- Conducting fine analysis of AO images and deconvolution
- Optimising 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, 2023.
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 β Pictoris Moving Group'*, The Astrophysical Journal, 2021.
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, 2022.

Muslimov, E., et al (including **Alexis Lau**), *'Current status of PAPYRUS: the pyramid based adaptive optics system at LAM/OHP'*, Proc. SPIE 11876, Optical Instrument Science, Technology, and Applications II, 2021.

CONFERENCES, WORKSHOPS AND SCHOOLS

AO4ELT7 (Oral presentation), 2023
LAM-GRD Seminar (Oral presentation), 2023
SPIE Astronomical Instrumentation (Poster presentation), 2022
NYRIA Workshop (Oral presentation), 2021, 2022
AO4ASTRO2 (Oral presentation), 2021
Spatially Resolved Spectroscopy with Extremely Large Telescopes (Oral presentation), 2021
ORP Instrumentation School, 2023
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)   May 2023 – Aug 2023

- Supervised a master student to work on AO-image deconvolution
- Supervised a student to work on solar 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

REFERENCES

Dr Benoit Neichel   email: benoit.neichel@lam.fr
PhD advisor   *Laboratoire d'Astrophysique de Marseille (LAM)*

Dr Romain Fetick   email: romain.fetick@lam.fr
PhD advisor   *Laboratoire d'Astrophysique de Marseille (LAM), ONERA*

Dr Thierry Fusco   email: thierry.fusco@lam.fr
PhD advisor   *Laboratoire d'Astrophysique de Marseille (LAM), ONERA*

Prof Sasha Hinkley   email: S.Hinkley@exeter.ac.uk
Master project supervisor   *University of Exeter*