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Email
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Skills
Software
Solid Works, ANSYS, MatLab, Maple ,Arduino, LabVIEW, CMM, MasterCAM, LaTex, MS Office
Programming
Python, C, FORTRAN, C++

Specialty
Astrophysics, galaxy, star formation, IFU spectroscopy, GMCs, AGN, MEMS, CAD, Aerodynamics

Languages
English ★★★★★
Mandarin ★★★★★
French ★★★★☆
Latin ★★★☆☆

AnanLU
PhD candidate at McGill Space Institute

Education

2021 - now **PhD, Physics** McGill University
• Relevant courses: Galaxy and Cosmology, Radiative Processes
• *Tentative Thesis: Star Formation Efficiency in the bulge of nearby galaxies, with data from SITELLE and ALMA. Supervisor: Prof. Daryl Haggard*

2020 - 2021 **Master of Science, Physics** McGill University
• Relevant courses: Astrophysics, Astrophysical Fluids, Machine Learning, High Energy Astrophysics. *Supervisor: Prof. Daryl Haggard.* GPA 3.94 (out of 4.0)

2018 - 2020 **Master of Engineering, Mechanical Engineering-Thesis** McGill University
• Relevant courses: Subsonic Aerodynamics, Experimental Fluid Dynamics, winged in-ground-effect vehicles
• *Title of the Thesis: "An investigation of ground effect on wingtip vortex generated by a rectangular NACA 0012 wing" . Supervisor: Prof. Tim Lee*

2011 - 2015 **Bachelor's Degree, Honour's Mechanical Engineering** McGill University
Dean's Honour List 2011-2012, GPA 3.51 (out of 4.0)
• Relevant courses: MEMS and Microfluids, Control Systems, 3D Printing, Advanced Fluid Dynamics, Spacecraft Dynamics, Multi-Disciplinary Optimization
• *Title of the Thesis: "3D Printing Physical Sensors with Flexible and Conductive Thermalplastic Materials" .*

Experience

07/20 - now **Graduate Researcher** Trottier Space Institute, McGill University, Canada
• Analyse observational data from SITELLE at CFHT, ALMA and VLA
• Understand star formation efficiency in extragalactic bulges and nuclear rings
Significant Projects:
- Star formation efficiency in the bulges of 8 galaxies using SITELLE and ALMA: NGC 3169 (published), NGC 524 (submitted), and the rest of galaxies in preparation.
- Leading proposals for a multi-wavelengths study of nuclear rings: combining VLA, ALMA, MUSE and JWST.
Supervisor: Prof. Daryl Haggard

09/18 - 06/20 **MEng Graduate Researcher** Aerodynamics Lab, McGill University, Canada
• Involve in several experimental aerodynamic projects. Data acquisition and analysis. Design and maintainence of experimental set-up
Significant Projects:
- Wind tunnel experiments on wingtip vortex behind rectangular wing in ground effect
- Effects of winglets on wingtip vortex in ground effect
- Comparison of different ground boundary condition (stationary and moving)
Supervisor: Prof. Tim Lee

04/16 - 07/18 **Junior Mechanical Engineer** LumenWerx
• Design custom sheet metal parts, and create drawings. Create CAD assemblies and bill of mateirals of standard or custom products.
• Involved in supply chain management using Epicor.
• Supervised a small team who create standard CAD assemblies, and provide training to new employees.

09/13 - 12/15 **Research Assistant** Biomechanical Microsystems Lab, McGill University, Canada
Significant Projects:
- Paper-based micro accelerometer and UV sensors
- 3D printing electronics and sensors with innovative materials
Supervisor: Prof. Xinyu Liu

Scientific Contributions

Lu, A. et. al (submitted). **WISDOM project--. Strong shear tearing molecular clouds apart in NGC 524.** *MNRAS*

Lu, A. et. al (2022). **WISDOM project--XI. Star Formation Efficiency in the Bulge of the AGN-host Galaxy NGC 3169 with SITELLE and ALMA.** *MNRAS, vol. 514, no. 4, pp. 5035–5055, 2022. doi:10.1093/mnras/stac1583.*

Lu, A. ; Lee, T. (2021). **Effect of Ground Boundary Condition on Near-Field Wingtip Vortex Flow and Lift-Induced Drag** *Journal of Fluids Engineering, 143(3)*

Lu, A. ; Lee, T. (2020). **Passive Wingtip Vortex Control by Using Tip-Mounted Half Delta Wings in Ground Effect** *Journal of Fluids Engineering, 142(2)*

Lu, A. , Tremblay-Dionne,V., Lee,T. (2019). **Experimental Study of Aerodynamics and Wingtip Vortex of a Rectangular Wing in Flat Ground Effect** *Journal of Fluids Engineering, 141(11)*

Elford, J.S., Davis, T.A., Ruffa, I., Bureau, M., Cappellari, M., Gensior, J., Iguchi, S., Liang, F.H., Liu, L., Lu, A. and Williams, T.G., (2024) **WISDOM Project-XVI. The link between circum-nuclear molecular gas reservoirs and active galactic nucleus fuelling.** *MNRAS, 528(1), pp.319-336.*

Liang, F.H., Smith, M.D., Bureau, M., Gao, F., Davis, T.A., Cappellari, M., Elford, J.S., Greene, J.E., Iguchi, S., Lelli, F. and Lu, A. , (2024) **WISDOM project–XVIII. Molecular gas distributions and kinematics of three megamaser galaxies.** *MNRAS, 527(3), pp.9343-9358.*

Daly, R.A., Donahue, M., O'Dea, C.P., Sebastian, B., Haggard, D. and Lu, A. , (2024) **New black hole spin values for Sagittarius A* obtained with the outflow method.** *MNRAS, 527(1), pp.428-436.*

Williams, T.G., Bureau, M., Davis, T.A., Cappellari, M., Choi, W., Elford, J.S., Iguchi, S., Gensior, J., Liang, F.H., Lu, A. and Ruffa, I., (2023) **WISDOM Project–XVII. Beam-by-beam properties of the molecular gas in early-type galaxies.** *MNRAS, 525(3), pp.4270-4298.*

Ruffa, I., Davis, T.A., Cappellari, M., Bureau, M., Elford, J., Iguchi, S., Lelli, F., Liang, F.H., Liu, L., Lu, A. and Sarzi, M., (2023) **WISDOM project–XIV. SMBH mass in the early-type galaxies NGC 0612, NGC 1574, and NGC 4261 from CO dynamical modelling.** *MNRAS, 522(4), pp.6170-6195.*

Choi, W., Liu, L., Bureau, M., Cappellari, M., Davis, T.A., Gensior, J., Liang, F.H., Lu, A. , Williams, T.G. and Chung, A., (2023) **WISDOM Project–XV. Giant molecular clouds in the central region of the barred spiral galaxy NGC 5806.** *MNRAS, 522(3), pp.4078-4097.*

Li, X., Wang, Y. H., Lu, A. , Liu, X. (2015) **Controllable hydrothermal growth of ZnO nanowires on cellulose paper for flexible sensors and electronics** *IEEE Sensors Journal, 15(11), 6100-6107.*

Oral Presentation: Lu, A. " Star formation efficiency in elliptical galaxies at cloud scale: case studies of NGC 0524 and NGC 0383", Canadian Astronomical Society (CASCA) 2021 AGM (National Conference), Penticton, Canada, June 12-16, 2023

Oral Presentation: Lu, A. " What is regulating star formation in galaxy bulges? Finding answers in molecular gas clouds with ALMA", ALMA 10 years mini-symposium, Online, Millimetre Astronomy Group at NRC Herzberg, March 9, 2023

Oral Presentation: Lu, A. " Star Formation Efficiency in the Bulge of the AGN-host Galaxy NGC 3169 with SITELLE and ALMA", American Astronomical Society (AAS) Meeting 240, Pasadena, Unites States, June 12-16, 2022

Oral Presentation: Lu, A. " Star Formation Efficiency in the Bulge of the AGN-host Galaxy NGC 3169 with SITELLE and ALMA", CRAQ Meeting 2022, Bishops, Canada, May 11-13, 2022

Oral Presentation: Lu, A. "Investigating Star Formation Suppression in Galaxy Bulges with SITELLE and ALMA", Canadian Astronomical Society (CASCA) 2021 AGM (National Conference), online, Canada, May 10-14, 2021