





# SUK YEE YONG

Machine learning specialist ★ Astrophysicist ★ Data scientist

CSIRO IM&T,  
13 Garden Street,  
Eveleigh, NSW 2015, Australia

✉ [sukyee.yong@csiro.au](mailto:sukyee.yong@csiro.au)  
🌐 <https://yongsukyee.github.io>  
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## WORK EXPERIENCE

- 06|2023–present **Scientific Computing Specialist in Machine Learning**  
Data Analytics & Visualisation Team, Information Management and Technology, Commonwealth Scientific and Industrial Research Organisation (CSIRO), *New South Wales, Australia*
- 09|2022–06|2023 **ARC Centre of Excellence for All Sky Astrophysics in 3 Dimensions (ASTRO 3D) Research Fellow in Data Intensive Astronomy**  
Joint position at School of Mathematics and Physical Science, Macquarie University and Australian Astronomical Optics (AAO) Data Central, *New South Wales, Australia*  
📄 Project: Uncertainty Quantification of Virial Black Hole Mass  
📄 Project: Retrieving the galaxy kinematics of integral field spectroscopic data  
📄 Project: Galaxy 3D Shape Recovery using Neural Networks
- 09|2020–08|2022 **CERC Postdoctoral Fellowship in Machine Learning and Artificial Intelligence (MLAI) Future Science Platform (FSP)**  
MLAI FSP Object Detection Activity, Space and Astronomy, CSIRO, *New South Wales, Australia*  
📄 Project: Finding the unknowns in radio astronomy data sets  
📄 Project: Kernel Design of Neural Network
- 03|2020–08|2020 **Postdoctoral Research Fellow in Astrophysics**  
School of Physics, University of Melbourne, *Victoria, Australia*  
📄 Project: Quasar disk-wind phenomenology
- 10|2019–03|2020 **Research Data Engineer**  
Centre for Eye Research Australia Limited, Royal Victorian Eye and Ear Hospital, *Victoria, Australia*  
📄 Project: The eyes and the sky — medical image analysis with astrophysics supercomputing
- 07|2019–09|2019 **Astrophysics Data Science Intern**  
Astronomy and Data Computing Services (ADACS), Swinburne University of Technology, *Victoria, Australia*  
📄 Project: Recover the 3D shape of galaxy using deep learning
- 07|2015–02|2016 **Research Assistant**  
School of Physics, University of Melbourne, *Victoria, Australia*  
Supervisor: Prof. Rachel Webster  
📄 Project: Modelling the Biases in Virial Black Hole Mass Estimation
- 08|2012–11|2012 **Research Assistant**  
Physics Department, Pennsylvania State University, *Pennsylvania, United States*  
Supervisor: Dr. Stephane Coutu
- 05|2012–08|2012 **Research for Undergraduate Experience (REU) Internship**  
Physics Department, Pennsylvania State University, *Pennsylvania, United States*  
Supervisor: Dr. Stephane Coutu
- 05|2011–08|2011 **Research Assistant**  
Astronomy and Astrophysics Department, Pennsylvania State University, *Pennsylvania, United States*  
Supervisor: Prof. David Burrows

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## EDUCATION

- 11|2019–03|2020 **Specialist Certificate in Research Practice for Scientists**  
*University of Melbourne, Parkville, VIC, Australia*
- 03|2016–02|2020 **PhD-Science (Physics)**  
*University of Melbourne, Parkville, VIC, Australia*  
Supervisor: Prof. Rachel Webster; Co-supervisor: Dr. Anthea King  
■ Thesis: Nature of Quasar Disk-wind
- 07|2013–07|2015 **Master of Science (Physics) with Distinction**  
*University of Melbourne, Parkville, VIC, Australia*  
Supervisor: Prof. Rachel Webster  
Weighted average mark (WAM): 82.125/100.0  
■ Thesis: Quasar Disk Wind Models and Emission Line Profiles
- 07|2010–12|2012 **Bachelor of Science (Physics) with Distinction**  
*The Pennsylvania State University, University Park, PA, United States*  
Major in Physics with Distinction and minor in Mathematics  
Grade point average (GPA): 3.85/4.0

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## SUPERVISING EXPERIENCE

Total student supervision: 7

- 07|2023–present **Primary supervisor**, Master of Science (Mathematics and Statistics), *School of Physics, University of Melbourne*
- 12|2022–03|2023 **Primary supervisor**, Vacation Scholarship, *AAO & MQAAAstro, Macquarie University*
- 12|2021–02|2022 **Secondary supervisor**, Laby Research Scholars Program, *School of Physics, University of Melbourne*
- 11|2021–02|2022 **Supervisor**, Undergraduate Vacation Scholarship Program, *Space and Astronomy, CSIRO*
- 02|2021–12|2021 **Secondary supervisor**, Laby Research Scholars Program, *School of Physics, University of Melbourne*
- 2016–2017 **Secondary supervisor**, Science Research Project (SCIE30001), *School of Physics, University of Melbourne*

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## TEACHING EXPERIENCE

- 07|2013–12|2020 **Laboratory Demonstrator**, *School of Physics, University of Melbourne*
- 03|–06|2019 **Teaching Assistant**, *School of Physics, University of Melbourne*

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## SELECTED PUBLICATIONS

Total publications: 15; First author: 8

- 2023 **Yong, S. Y.** and Ong, C. S. 2023. “Uncertainty quantification of the virial black hole mass with conformal prediction”. *MNRAS* [[arXiv](#) | [DOI](#) | [Code](#)]
- 2022 Tsuchida, R. and **Yong, S. Y.** 2022. “Detecting structured signals in radio telescope data using rkhs”. In: *36th Neural Information Processing Systems 2022 Workshop on Machine Learning and the Physical Sciences* [[PDF](#)]
- 2022 **Yong, S. Y.**, Hobbs, G., Huynh, M. T., Rolland, V., Petersson, L., et al. 2022. “SPARKESX: Single-dish PARKES data sets for finding the unEXpected - a data challenge”. *MNRAS* 516.4, pp. 5832–5848 [[arXiv](#) | [DOI](#)]
- 2022 **Yong, S. Y.**, Hobbs, G., Huynh, M. T., Rolland, V., Petersson, L., et al. 2022. *SPARKESX: Single-dish PARKES data sets for finding the unEXpected*. CSIRO Data Collection [[Part 1](#), [2](#), [3](#), [4](#)]
- 2022 Luo, R., Hobbs, G., **Yong, S. Y.**, Zic, A., Toomey, L., et al. 2022. “Simulating high-time resolution radio-telescope observations”. *MNRAS* 513.4, pp. 5881–5891 [[arXiv](#) | [DOI](#)]

- 2022 Tsuchida, R., **Yong, S. Y.**, Armin, M. A., Petersson, L., and Ong, C. S. 2022. “Declarative nets that are equilibrium models”. In: *International Conference on Learning Representations* [OpenReview]
- 2020 **Yong, S. Y.**, Webster, R. L., King, A. L., Bate, N. F., Labrie, K., et al. 2020. “Determining quasar orientation”. *MNRAS* 491.1, pp. 1320–1334 [arXiv | DOI]
- 2019 **Yong, S. Y.** and Webster, R. L. 2019. “Black Hole Mass Estimation: Modelling the Biases”. In: *2019 6th International Conference on Space Science and Communication (IconSpace)*, pp. 139–143 [IEEE]
- 2018 **Yong, S. Y.**, King, A. L., Webster, R. L., Bate, N. F., O’Dowd, M. J., et al. 2018. “Using the Properties of Broad Absorption Line Quasars to Illuminate Quasar Structure”. *MNRAS* 479.3, pp. 4153–4171 [arXiv | DOI]


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## AWARDS AND ACHIEVEMENTS

- 2021 **Non cash reward** for demonstrating diverse, inclusive, belonging behaviour, *CSIRO MLAI FSP*
- 2021 **3<sup>rd</sup> place** in Pitch initiative for Machine Learning and Artificial Intelligence Reimagining Science 2021, *CSIRO MLAI FSP*
- 2021 **Non cash reward** for next level effort produced as one of the finalists in the Pitching initiative for MARS 2021, *CSIRO MLAI FSP*
- 2021 **Non cash reward** for generating collaborative videos for the MARS 2021 conference, within a short timeframe and despite conflicting priorities, *CSIRO*
- 2016–2020 **Melbourne Research Scholarship** Doctor of Philosophy, *University of Melbourne*
- 2019–2020 **Australian Postgraduate Research Intern**, *Cylite*
- 2019 **Astronomy and Data Computing Services Internship Program**, *Astronomy Australia Limited*
- 2019 **Best paper award** in track Astronomy and Astrophysics, Interdisciplinary Space Science and Others, *6<sup>th</sup> International Conference on Space Science and Communication*
- 2018 **Science Abroad Travelling Scholarship**, *University of Melbourne*
- 2015 **Ramm Prize in Experimental Physics**, *University of Melbourne*
- 2014 **Coursework Studentship**, *University of Melbourne*
- 2011–2012 **Bert Elsbach Scholarship in Physics**, *Pennsylvania State University*
- 2010–2012 **Dean’s List** for every semester, *Pennsylvania State University*
- 2008–2012 **Public Service Department Scholarship for Overseas Degree Programme**, *Malaysia*
- 2012 **Donald and Barbara Weyenberg Graduate Fellowship**, *Pennsylvania State University*
- 2011 **Sigma Pi Sigma National Physics Honor Society**, *Pennsylvania State University*

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## SELECTED SEMINARS, COLLOQUIA, AND INVITED TALKS








- Total presentations: 13
- 01|2023 Global Malaysian Astronomers Convention 2023, *National Science Center, Kuala Lumpur, Malaysia*  
 ★ Invited talk: Enabling Data-driven Astronomy - from data archive to data mining
- 12|2022 Science Espresso, *Science Cafe Kuala Lumpur, Virtual*  
 ★  Invited talk: Can Artificial Intelligence Discover Extraterrestrial Intelligence?
- 06|2022 Object Detection Forum, *CSIRO MLAI FSP, Virtual*  
 ★ Talk: Transformers with HuggingFace
- 03|2022 Science Seminars, *CSIRO MLAI FSP, Virtual*  
 ★ Talk: Anomaly Detection for Time-domain Discoveries

- 09|2021 Machine Learning in Astronomy, *Western Sydney University, Virtual*  
 \*  Talk: 3D Galaxy Shape using Mixture Density Network
- 03|2021 Co-learnium Series, *CSIRO Australia Telescope National Facility, Virtual*  
 \*  Talk: Hunting for the Unknowns in the Universe
- 09|2020 Managing Your Career during a Pandemic, *Astronomical Society of Australia Early Career Researcher Chapter, Virtual*  
 \*  Panelist: Discussed and shared my personal journey in data science job
- 07|2018 Research Visitor, *University of Southampton, Winchester, United Kingdom*  
 \* Talk: Quasar Disk Winds

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## SELECTED CONFERENCE CONTRIBUTIONS

Total presentations: 22

- 12|2022 36<sup>th</sup> Neural Information Processing Systems 2022 Workshop on Machine Learning and the Physical Sciences, *Virtual*  
 \*  Paper and poster: Detecting structured signals in radio telescope data using RKHS
- 11|2022 ASTRO 3D Annual Retreat, *The Playford MGallery, SA, Australia*  
 \* Lead discussion: Maximising legacy and return for Data Intensive Astronomy
- 08|2022 International Astronomical Union General Assembly 2022, *BEXCO, Busan, Republic of Korea*  
 \* e-Talk: Making Unexpected Time-domain Discoveries in Astronomy with Machine Learning
- 06|2022 Machine Learning and Artificial Intelligence Reimagining Science (MARS) 2022, *Jones Bay Wharf, NSW, Australia*  
 \*  Presentation: It's Your Business — Digital, National Facilities and Collections
- 04|2022 10<sup>th</sup> International Conference on Learning Representations, *Virtual*  
 \* Poster: Declarative nets that are equilibrium models
- 11|2021 The 13th Asian Conference on Machine Learning, *Virtual*  
 \* Accepted as participant: Online Asian Machine Learning School
- 10|2021 ACAMAR Fast Radio Bursts Workshop, *Virtual*  
 \*  Talk: Training Machine Learning to Detect Fast Radio Bursts: The Challenges
- 07|2021 Collaborative Conference on Computational and Data Intensive Science C3DIS, *Virtual*  
 \*  Lightning talk: Hunting the Unknowns in Murriyang, an Anomaly Detection Approach
- 06|2021 MARS 2021, *Virtual*  
 \*   Postdoc pitch
- 11|2019 X-Sensing 2019 Cross-disciplinary Conference on Scientific Analytics, *Coffs Harbour, NSW, Australia*  
 \* Hack day: Automated mapping of mangrove and saltmarsh from aerial imagery
- 07|2019 2019 6<sup>th</sup> International Conference on Space Science and Communication, *Pulai Springs Resort, Johor, Malaysia*  
 \*  Paper and talk: Black Hole Mass Estimation: Modelling the Biases

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## SKILLS

Technical Programming Languages	Data analysis, git, L <sup>A</sup> T <sub>E</sub> X, machine learning, Microsoft Office, visualisation Python — MATPLOTLIB, NUMPY, PANDAS, PYTORCH, SCIKIT-LEARN, SCIPY English, Malay (fluent); Chinese, Japanese (basic)
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Updated: July 24, 2023