

# Affan Adly Bin Nazri

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## EDUCATION

### UNIVERSITI MALAYA

*Doctor of Philosophy in Physical Sciences (Astrophysics)*

2022 - Present

Dissertation: "Study of Massive Young Stellar Objects: RCW 142"

Supervisors: Prof. Dr. Zamri Zainal Abidin, Dr. Zulfazli Rosli

### UNIVERSITI MALAYA

*Bachelor of Science in Physics*

2018 - 2022

Thesis: "Fast Radio Burst Detection with Python Language Burst"

Supervisor: Prof. Dr. Zamri Zainal Abidin

CGPA: 3.94/4.00 (First Class Honours)

### PUSAT ASASI SAINS UNIVERSITI MALAYA (PASUM)

*Foundation in Physical Sciences*

2017 - 2018

CGPA: 4.00/4.00

## WORK EXPERIENCE

### RESEARCH ASSISTANT TRAINEE

*Radio Cosmology Research Laboratory, Universiti Malaya*

July - September 2021

- Supported grant preparation and documentation workflows
- Assisted with student supervision and technical troubleshooting
- Managed websites and digital resources for the laboratory
- Organised academic events and meetings
- Prepared reports and administrative documents

## ACADEMIC EXPERIENCE

### EYES OF GRAVITY WORKSHOP

*Local Organising Committee Member*

Online; July 2025

- Served on the Local Organizing Committee for an international astronomy workshop hosted by the Radio Cosmology Research Laboratory, Universiti Malaya, focused on gravitational lensing, a fundamental astrophysical phenomenon where light from distant sources is bent by massive foreground objects, providing insight into dark matter, distant galaxies, and cosmological structures.
- Coordinated logistics, speaker engagement, and program development for a full-day online event, including invited expert talks, conceptual overviews, and hands-on sessions featuring analysis techniques and the GLAFIC software tool for lens modeling.
- Facilitated academic exchange among participants and experts, enhancing understanding of gravitational lensing theory, practical data analysis, and current research applications in astrophysics.

### JCMT USERS MEETING 2024

*Local Organising Committee Co-Chair*

Kuala Lumpur, Malaysia; June 2024

- Co-chaired the Local Organising Committee for the JCMT Users Meeting 2024, a major international conference for users of the James Clerk Maxwell Telescope.

- Led logistics planning and on-site coordination for an international JCMT community meeting, including venue setup, scheduling, registration flow, and participant support.
- Designed and prepared official event materials, including lanyards, posters, banners, and bunting, ensuring consistent visual identity and professional presentation across all physical and promotional assets.
- Served as technical lead for the meeting, overseeing audio-visual systems, live presentations, hybrid/online connectivity, and real-time troubleshooting to ensure seamless delivery of talks, tutorials, and discussions.

## **INTERNATIONAL ASTRONOMICAL UNION SYMPOSIUM 377**

*Local Organising Committee Member*

*Kuala Lumpur, Malaysia; January -- February 2023*

- The International Astronomical Union (IAU) Symposium was the first IAU symposium in Southeast Asia since 1990, the first ever in Malaysia, and the largest professional astronomy conference held in the country, covering early disk-galaxy formation from JWST observations to Milky Way studies through plenary talks, invited lectures, posters, and public outreach.
- In conjunction with the symposium, the IAU Monsoon School 2023 was organised at Universiti Malaya, providing intensive training for students in foundational astrophysics, scientific programming, and data science.
- Served as a member of the Local Organising Committee for both the symposium and the Monsoon School, with primary responsibilities in logistics coordination, technical operations, and on-site ground management, supporting the smooth execution of large-scale international scientific events.

## **EXPLORING GALAXIES WITH MANGA WORKSHOP**

*Local Organising Committee Chair*

*Online; September 2021*

- Chaired the Local Organising Committee for an online workshop focused on the MaNGA survey, a major component of the Sloan Digital Sky Survey (SDSS) that provides spatially resolved spectroscopy of thousands of nearby galaxies, enabling detailed studies of galaxy formation and evolution.
- Directed all LOC activities, including planning, coordination, and execution of workshop logistics and technical programming.
- Liaised with scientific organisers, speakers, and support staff to ensure successful delivery of sessions and outreach components.
- Managed communications with attendees and speakers to facilitate smooth operations throughout the event.

## **RESEARCH INTERESTS & PROJECTS**

### **STAR FORMATION**

*High-mass star formation, masers, protostellar outflows, molecular clouds, astrochemistry, hub-filament systems*

- Bowshocks in AFGL 5142-MM1: Demonstrated slowing bowshock dynamics by comparing short-term maser proper motions with long-baseline measurements, indicating either maser-shock decoupling or physical deceleration (Article).
- Formaldehyde in the Milky Way: Established the widespread presence of formaldehyde in Galactic molecular clouds, supporting its role as a tracer of star-forming environments and potential biogenic precursors (Article).
- Hub-Filament System in W40: Identified a hub-filament morphology in the W40 star-forming region through multi-wavelength analysis, with evidence for secondary, triggered star formation (Article).
- Maser 3D Kinematics in RCW 142: Analysing VLBI water maser data to derive 3D velocity fields and investigate dynamical processes in massive star formation.

### **RADIO ASTRONOMY INSTRUMENTATION**

*Radio frequency interference (RFI), radio telescopes, antenna systems, signal processing, data acquisition systems, very long baseline interferometry (VLBI)*

- High-cadence RFI Pilot Study: Conducted high-cadence RFI monitoring and temporal analysis at a candidate Malaysian radio astronomy site, establishing baseline interference characteristics for site evaluation (Article).
- Automated RFI Monitoring System: Development of an automated RFI monitoring system for Malaysia's potential radio astronomy sites, featuring remote data acquisition, processing, and analysis.

## **GALAXIES, CLUSTERS, AND LARGE-SCALE STRUCTURE**

*Galaxy evolution, cosmic filaments, galaxy clusters, active galactic nuclei (AGNs), submillimetre galaxies, high-redshift galaxies*

- Galaxy Properties in Cosmic Filaments: Using high-resolution radio observations to examine how large-scale filamentary environments influence galaxy evolution.
- Radio Properties of Galaxies in Cluster Environments: Analysing all-sky radio survey data to quantify the impact of cluster environments on the radio properties of galaxies.
- RAWs Project: Combining radio (RACS) and infrared/visible (WISE/SCOS and SDSS) data to characterise galaxy properties in cosmic filaments across multiple wavelengths (Article).
- RAGERS: Contributing to the JCMT Large Program RAdio Galaxy Environment Reference Survey (RAGERS), investigating submillimetre galaxies in AGN-centred protocluster environments (Article).
- Submillimetre Galaxies in the COSMOS Field: Investigating the physical and radio properties of high-redshift submillimetre galaxies using deep, multiwavelength COSMOS survey data.

## **SOLAR PHYSICS AND SPACE WEATHER**

*Solar activity, solar wind, geomagnetic activity, ionospheric disturbances, solar flares, solar bursts*

- Earth's Ionospheric Response to Solar Activity: Analysing global GNSS-derived total electron content and OMNI solar-geomagnetic datasets to characterise phase-dependent correlations and time-lagged ionospheric responses over three solar cycles (Article).
- Influence of Solar Wind Dynamics on Earth's Geomagnetic Activity: Using long-term OMNI observations and spectral analysis across solar cycles 21-25 to quantify solar-cycle-dependent relationships between solar wind dynamics and geomagnetic indices (Dst, AE).

## **FAST RADIO BURSTS (FRBS)**

*FRB detection algorithms, data analysis pipelines*

- Detection of FRBs: Developed and validated a standalone Python-based pipeline for automated detection of fast radio bursts in radio telescope data, achieving performance comparable to established FRB search frameworks.
- Phantom Signals in FAST FRB Searches: Characterising non-astrophysical signals in FAST FRB search pipelines to trace their origins and reduce false-positive detections.

## **PUBLICATIONS**

- Baharin, N. B., **Nazri, A. A.**, Rosli, Z., Abidin, Z. Z., Tajuddin, H. A., Esimbek, J., ... Tang, X. (2025). Rethinking habitability using biogenic precursors: Formaldehyde in millimeter molecular clouds of the inner Galaxy. *The Astrophysical Journal*, 988(1), 36. doi:10.3847/1538-4357/add691
- Hassan, M. S. R., Abidin, Z. Z., & **Nazri, A. A.** (2025). The RAWs Project: I. Do AGN quench their activity in cosmic filaments at redshifts up to  $z \sim 0.6$ ? *Monthly Notices of the Royal Astronomical Society*, 3696–3708. doi:10.1093/mnras/staf1209
- Hassan, Z., Abidin, Z. Z., **Nazri, A. A.**, & Baharin, N. B. (2026). Investigating ionospheric TEC variations in solar and geomagnetic influences across solar activity phases. *Advances in Space Research*. doi:10.1016/j.asr.2026.02.030
- Lim, M.-K., Yadav, R. K., Dewangan, L. K., Kim, K.-T., Zavagno, A., Maklai, J., ... Sharma, S. (2025). FIRESTORM I: Stellar feedback and gas kinematics in the evolved W40 hub-filament system. *Monthly Notices of the Royal Astronomical Society*, 545(4). doi:10.1093/mnras/staf2218
- **Nazri, A. A.**, Abidin, Z. Z., Mat Sabri, M. R., Rosli, Z., Hassan, M. S. R., Mohd Radzi, M. S., ... Dong, L. (2025). Temporal variability in low-frequency radio interference: Insight from high-cadence monitoring at a candidate radio notification zone in Malaysia. *Advances in Space Research*, 76(3), 1832–1853. doi:10.1016/j.asr.2025.05.035

- Rosli, Z., Burns, R. A., **Nazri, A. A.**, Sugiyama, K., Hirota, T., Kim, K.-T., ... Abidin, Z. Z. (2023). Limits of water maser kinematics: Insights from the high-mass protostar AFGL 5142-MM1. *Monthly Notices of the Royal Astronomical Society*, 527(4), 10031–10037. doi:10.1093/mnras/stad3767
- Zhou, D., Greve, T. R., Gullberg, B., Lee, M. M., Mascolo, L. D., Dicker, S. R., ... Ibrahim, U. F. S. U. (2024). The RAdio Galaxy Environment Reference Survey (RAGERS): Evidence of an anisotropic distribution of submillimeter galaxies in the 4C 23.56 protocluster at  $z = 2.48$ . *Astronomy & Astrophysics*, 690, A196. doi:10.1051/0004-6361/202348500

## PRESENTATIONS & EVENTS

- East Asian VLBI Workshop 2025 (Pyeongchang, South Korea; November 2025) - Presenter
- UM-NARIT 5th Bilateral Symposium (Chiang Mai, Thailand; October 2025) - Presenter
- Global Malaysian Astronomers Convention 2023 (Kuala Lumpur, Malaysia; January 2023) - Participant
- The 2nd Malaysian VLBI Workshop 2022 (Kuala Lumpur, Malaysia/Hybrid; September 2022) - Participant
- 2nd UM-NARIT Bilateral Symposium 2022 (Online; August 2022) - Participant
- JCMT Users Meeting 2022 (Online; February 2022) - Participant
- SOKENDAI Asian Winter School 2021 (Online; February 2022) - Participant
- FRB 2021 Conference (Online; July – August 2021) - Participant
- UM-NARIT Bilateral Symposium (Online; June 2021) - Participant
- Radio Astronomy Workshop on CASA Pipeline for ALMA Data (Online; November 2020) - Participant
- Terascale Summer School 2020 (Online; July – August 2020) - Participant
- Sakura Science High School Exchange Program 2016 (Tokyo, Japan; May 2016) - Participant
- National Science Challenge 2015 (Kuala Lumpur, Malaysia; February – October 2015) - Participant

## AWARDS & HONOURS

- Bachelor's Degree with First Class Honours, Universiti Malaya (2022)
- University Book Prize, Universiti Malaya (2022)
- Dean's List, Faculty of Science, Universiti Malaya (6 semesters, 2018 - 2022)
- PASUM Top 20 for Physical Sciences, Pusat Asasi Sains Universiti Malaya (2018)
- Best Student Award in Sijil Pelajaran Malaysia for Science Stream, SMK Batu Lapan Jalan Puchong (2016)
- National Level First Runner-up, National Science Challenge (2015)
- Semifinal Level Overall Top Four, National Science Challenge (2015)
- Semifinal STEM Quiz Top Scorer, National Science Challenge (2015)
- Selangor State Level Champion, National Science Challenge (2015)