

Dr. Robert Džudžar

 <https://www.linkedin.com/in/robertdzudzar/>

Experience

2020

Intern, *Astronomy Data and Computing Services (ADACS)*, Melbourne, Australia, 3 months.

My responsibility: Being a part of a team that follows Agile scrum methodology, I am leading development of a dynamical and interactive visualisation (using python and bokeh) and presenting/discussing progress with stakeholders. In addition, I am involved in web development with Django within a professional software development environment.

2016

2020

PhD research, *Centre for Astrophysics and Supercomputing*, Melbourne, Australia.

During my PhD candidature I gained experience with data mining, cleaning and analysis using **Python**. Obtained data from various databases, telescopes and computer simulations in a form of: catalogues, images, 3D data-cubes, and large output files from simulations.

2020

APAC Virtual Hackathon: Digital Defence Hack, *1st place with myself as team captain*, 21/22 November.

As a team, we have successfully detected anomalies (fraud activities) within bank transactions. Tools used: Python, NEO4j, Tableau and Graphistry. Video presentation can be found here.

Educational Background

2016

2020

PhD Astrophysics, *Swinburne University of Technology, Centre for Astrophysics and Supercomputing*, Melbourne, Australia.

Scholarship: Swinburne University Postgraduate Research Awards (SUPRA)

Thesis: The evolution of galaxies in the HI-rich group environment

Supervisors: Prof. Virginia Kilborn, Dr. Sarah M. Sweet, Prof. Gerhardt Meurer

2014

2016

MSc Astrophysics, *AstroMundus International Master Program*, Innsbruck – Austria; Padova and Rome – Italy.

Scholarship: ErasmusMundus Scholarship, Category A

Thesis: Dwarf galaxy evolution in the massive and dynamically active cluster A3266

Supervisor: Prof. Francine Marleau

2008

2014

BSc Physics, *University of Novi Sad, Faculty of Science, Department of Physics*, Novi Sad, Serbia.

Scientific field: Physics - Astronomy

Research Proposals

Observational projects as Principal Investigator (PI)

2020

Australia Telescope Compact Array, Awarded 223.5 hours on a shared PI project "The lords of rings: HI gas and kinematic properties of ring galaxies".

2018

ANU 2.3m: Wide-Field Spectrograph (WiFeS), Awarded three nights to observe galaxy: HIPASSJ0400-52:S1 - observations failed due to weather.

2017

Australia Telescope Compact Array, Awarded 87 hours to map HI content of group galaxies.

2017

Nobeyama 45-m, Awarded 45 hours to map ¹²CO content of group galaxies..

2017

Very Large Array, Allocated 2h of observations.

Observational projects as Co-Investigator (Co-I)

2019

Australia Telescope Compact Array, Awarded 134 hours for project: HI galaxies with little or no star formation, (Brown, Parkash, Dzudzar et al.).

2019

ALMA, ~14 hours for: Molecular gas in HI eXtreme galaxies, (Lutz, Brown, Catinella, Cortese, Denes, Dzudzar et al.).

Programming Project

2019

Contributed project to National Optical Astronomy Observatory Data Lab, I developed a python script in jupyter notebook for an **interactive exploration** of multi-wavelength data-sets, published at <https://datalab.noao.edu>; the script is also available on my github.

2019

Screenplay analysis, Converting the raw screenplay from HTML to text and using **text processing** to extract, clean and analyse data. Outputs include: wordclouds, phrases, analysis of the character, episodes and seasons, sentiment analysis and interactive exploration of the characters number of lines with **bokeh**..

Languages

Rusyn, Serbian Native; Bilingual Proficiency

English Fluent

Spanish Basic

Slavic languages Basic understanding

Skills and Interests

Programming **Python** - 4yr experience

Python packages:

Matplotlib, NumPy, Pandas, APLpy, Bokeh, SciPy, Astropy

Scikit-learn, Django, Seaborn, ChainConsumer, H5py and mpi4py

Tools Tableau, Github, L^AT_EX, Microsoft Office, Spyder, Jupyter Notebook, Oracle

MIRIAD, CASA, SAODS9; 3DBarolo, Iraf, Source Extractor, GALFIT
OzSTAR - basic experience with sbatch and modules

Interests & Strengths Data Mining, Visualisation, Data Analysis, Problem Solving, Big Data, Research
Data Visualisation, Research, Image and Data Processing, Data Mining
Communication, Organisation, Presentation, Team Work, Leadership
Critical Thinking, Project Management

Schools, Seminars, Courses

2012

2020

Online Courses (mostly Coursera), *Finished*: *An introduction to Interactive Programming in Python, Galaxies and Cosmology, Dark Matter in Galaxies: The Last Mystery, Computing for Data Analysis, Introduction to Computer Science and Programming, Introduction to Data Science in Python, Applied Plotting, Charting & Data Representation in Python, Fundamentals of Visualization with Tableau, Data Visualization with Tableau Specialization (5 courses), Applied Machine Learning in Python, SQL for Data Science.*

2017

Radio Astronomy School, Australia Telescope Compact Array, Narrabri, Australia.

2017

CAASTRO, Coding workshop, Swinburne University, Australia.

2019

Swinburne, Code testing workshop, Swinburne University, Australia.

2020

ADACS, ADACS astrocomp hack week: gave a flash talk about interactive visualisation, AAO, Sydney, Australia.

Talks and Posters

2017

Talk: "HI in Choir HIPASSJ2027-51", at the Swinburne workshop "From Field To Clusters: HI as a tracer of galaxy evolution, Melbourne, Australia.

2017

Talk: "Gas-rich galaxies in the group environment", Bolton and Student Symposium at the CSIRO, Sydney, Australia.

2018

Poster: "From SINGG to Choirs", KIAA, Forum on Gas in Galaxies, Beijing, China.

2018

Poster: "From SINGG to Choirs", ASA, Annual Scientific Meeting, Melbourne, Australia.

2019

Poster: "Choirs: gas-rich galaxy groups", Australia-ESO joint conference, Sydney, Australia.

2019

Poster: "Galaxy ESO156-G029", ASA, Annual Scientific Meeting, Brisbane, Australia.

2019

Talk: 'HI-rich haloes from the Dark Sage semi-analytic model', RE-SOLVE meeting in US, Remote attendance.

Event Organization

2012

2015

Supervisory Board, Member of the Member of the Supervisory Board of Astronomical Society of Novi Sad, Serbia.

2012
2014

Co-founder of "Novosadska skola astronomije", *School of Astronomy for general public, co-founder and lecturer, Novi Sad, Serbia.*

2018

LOC, *Member of the Local Organizing Committee at ANITA Student School and Workshop, Melbourne, Australia.*

2018
2019

STAC, *Member of the Swinburne Telescope Allocation Committee for Keck Telescope, Melbourne, Australia.*

Teaching Experience

Teaching Assistant

2018
2019

Discovering the Universe, Laboratory tutor - one semester in 2017. and Tutor in one semester in 2018..

2019

Electronics and electromagnetism, Laboratory tutor.

2019

eScience, Laboratory tutor: Introduction to data science and R.

Outreach

2010
2015

Educator at various Astronomy events:, *Researchers' Night, Festival of Science, lecturer at Planetarium of Astronomical Society, Novi Sad, Serbia.*

2018
2020

AstroTour guide, *Swinburne University.*

Publications

- [Džudžar et al., 2019a] Džudžar, R., Kilborn, V., Meurer, G., Sweet, S. M., et al. (2019a). The neutral hydrogen properties of galaxies in gas-rich groups. *MNRAS*, 483:5409–5425.
- [Džudžar et al., 2019b] Džudžar, R., Kilborn, V., Murugesan, C., Meurer, G., Sweet, S. M., and Putman, M. (2019b). Group pre-processing versus cluster ram-pressure stripping: the case of ESO156-G029. *MNRAS*, 490(1):L6–L11.
- [Džudžar et al., 2021] Džudžar, R., Kilborn, V., Sweet, S. M., Meurer, G., Jarrett, T. H., and Kleiner, D. (2021). Environmental processing of galaxies in H I-rich groups. *MNRAS*, 500(3):3689–3710.
- [Li et al., 2020] Li, J., Obreschkow, D., Lagos, C., Cortese, L., Welker, C., and Džudžar, R. (2020). Angular momentum-related probe of cold gas deficiencies. *MNRAS*, 493(4):5024–5037.
- [Murugesan et al., 2019] Murugesan, C., Kilborn, V., Obreschkow, D., Glazebrook, K., Lutz, K., Džudžar, R., and Dénes, H. (2019). Angular momentum regulates H I gas content and H I central hole size in the discs of spirals. *MNRAS*, 483:2398–2412.