ARIEL WERLE

ASTROPHYSICIST

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Ariel Werle

ABOUT ME

I collect photons from galaxies and transform them into useful information about their contents.

I obtained my PhD in Physics in 2019 from the Federal University Santa Catarina (Brazil). I am now a postdoc in the GASP team, studying jellyfish and post-starburst galaxies employing a variety of data analysis methods.

Check out an updated list of my publications here.

EDUCATION

PhD. in physics | Universidade Federal de Santa Catarina

2015 – 2019

Thesis: Analysis of SDSS Spectra and GALEX Photometry with STARLIGHT: Stellar Populations and Dust in Local Galaxies

Reconstructing the formation histories of more than 200 thousand galaxies based on their ultraviolet images and optical spectra. Developing a new version of a traditional spectral synthesis code based on Markov chain Monte Carlo (see documentation) and developing python wrappers.

MSc. in physics | Universidade Federal de Santa Catarina

2012 – 2014

Thesis: Post-Starburst Galaxies in the Local Universe

Classification and characterization of a sample of recently quenched galaxies selected from the SDSS.

Bachelor's in physics | Universidade Federal de Santa Catarina

2007 – 2011

EXPERIENCE

Postdoctoral Researcher | INAF – Osservatorio Astronomico di Padova

MARCH 2020 – PRESENT

Compilation of a sample of cluster galaxies from MUSE data cubes, determination of spatially resolved star-formation histories and spectral classification using CNNs.

Bayesian inference of physical properties of star-forming regions in galaxies observed with the Hubble Space Telescope; this work was highlighted several times in the ESA/NASA websites.

Postdoctoral Researcher | Universidade de São Paulo

MARCH 2019 – FEBRUARY 2020

Data acquisition, quality control and calibration for the S-PLUS astronomical survey, which maps two thirds of the southern sky. Simulating observations and determining galaxy parameters using machine learning techniques.

University Teacher | Universidade Federal de Santa Catarina

AUGUST 2014 – MARCH 2015

Teaching entry-level undergraduate mathematics courses (calculus and linear algebra).

TEACHING

Alternanza scuola-lavoro (PCTO)

FEBRUARY 2023

Lectures on Bayesian inference of galaxy properties for high-school students. Code available at github.com/arielwrl/PCTO_BAGPIPES

Astronomical databases and astrostatistics in the era of big data

JULY 2021

Lectures on SQL, ADQL and querying the SDSS and S-PLUS databases.

IX La Plata International School (LAPIS) on Astronomy and Geophysics

FEBRUARY 2020

Lectures on introduction to python, data visualization and determination of galaxy parameters. Code available at github.com/arielwrl/lapis_notebooks

Mathematics tutoring | Universidade Federal de Santa Catarina

FEBRUARY 2015 – FEBRUARY 2016

Tutoring undergraduate students on entry-level math courses

COURSES AND WORKSHOPS

- Data-driven Astronomy
- Big data within science and industry
- High-Angular Resolution Observations from the Ground
- First Light: Stars, Galaxies and Black Holes at the Epoch of Reionization
- Machine Learning with Python
- NEBULATOM III
- XVII IAG/USP Advanced School on astrophysics: 3D spectroscopy & spectral synthesis
- II Winter School of the Valongo Observatory

SKILLS

- Programing and scripting: Python, SQL, Fortran, Bash
- Data Analysis: Matplotlib, Pandas, Scikit-learn, Tensor Flow, Plotly, Dash, Astropy
- Markup: Latex, Markdown
- Version control: Git

LANGUAGES

- Portuguese
- English
- Italian
- Spanish

SOFTWARE DEVELOPMENT

Pycasso2

A new version of the python CAlifA Starlight Synthesis Organizer (pycasso) that was generalized to run Starlight in MUSE, MANGA and GMOS datacubes. It also includes Dobby, a free ELF (Emission Line Fitter).
bitbucket.org/streeto/pycasso2
adsabs.harvard.edu/abs/2022ascl.soft06021D

PySINOPSIS

A set of python tools serving as a high-level interface for the SINOPSIS (SImulatiNg OPtical Spectra wIth Stellar population models) code. Also contributed with testing and validation of SINOPSIS.
github.com/arielwrl/pysinopsis

Starlight Toolkit

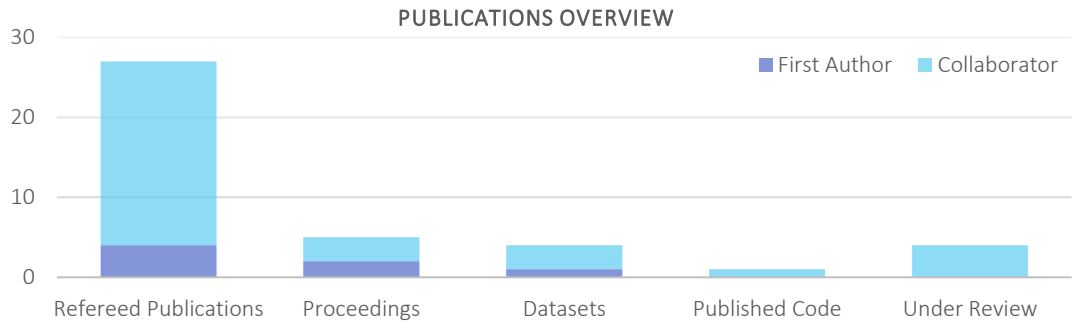
A set of python tools serving as a high-level interface for Starlight, developed as part of my PhD.
github.com/arielwrl/starlight_toolkit

Starlight

I developed an upgrade to a traditional spectral fitting code, allowing for the addition of photometric fluxes as additional constraints.
bitbucket.org/awerle/starlight_dev_public
Manual available here

SCIENTIFIC PUBLICATIONS

Access to full publication list: ADS | ORCID



REFERENCES

Bianca Poggianti
Director of the Padova Observatory
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Roberto Cid Fernandes
Former PhD. Advisor
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Claudia Mendes de Oliveira
PI of the S-PLUS survey
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