Dr Angelos Tsiaras

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Research interests

Observations of exoplanetary systems, data analysis, data simulations, photometry, spectroscopy, exoplanets characterisation, modelling of light-curves from exoplanetary systems, developing user-friendly scientific tools.

Education

- **PhD in Astronomy** September 2014 – September 2017
  Department of Physics and Astronomy, University College London, UK.
  Thesis title: *Towards a population of explanetary atmospheres*.
  Subjects: Transit spectroscopy of exoplanets with the HST/WFC3 camera, data analysis, calibration, spectra-photometry, transit modelling, atmoshperic retrievals, simulating observations.
  Supervisors: Prof. Giovanna Tinetti and Dr. Ingo P. Waldmann.
- **BSc in Physics (Ptychion)** 9.38/10.00 – First Class September 2009 – July 2014
  Department of Physics, Aristotle University of Thessaloniki, Greece.
  Thesis title: *Detection of an additional extra-solar planet and simulation of perturbations on transit light-curves*.
  Subjects: Transits of exoplanets from the ground, data analysis, photometry, modelling. Planet-planet transits in *Kepler* data, data de-trending and modelling.
  Supervisor: Prof. John H. Seiradakis

Work experience

- Post-doctoral researcher at University College London. November 2017 – today
- Research astronomer at Royal Observatory Greenwich. October 2019 – today

Current projects

- Atmospheric characterisation of exoplanets with the Hubble Space Telescope.
- Introducing machine learning approaches to exoplanet data analysis.
- Developing open-source and user-friendly data analysis software for exoplanets.
- Co-leader of the data analysis working group and the ground-based photometric follow-up working group of ARIEL, the ESA M4 mission to investigate the atmospheres of 1000 exoplanets.
- Coordinator of the ExoClock project, a citizen science project that involves professional and amateur astronomers, with the aim of following-up transiting exoplanets with small telescopes.
- Science manager of the ExoWorlds Spies project, an educational project aiming to bring schools, amateur astronomers and the general public exoplanet closer to exoplanet research.

List of publications

Peer reviewed articles

- **Tsiaras** et al. 2019. *Water vapour in the atmosphere of the habitable-zone eight-Earth-mass planet K2-18 b.* Nature Astronomy, 451.
- **Tsiaras** et al. 2018. *A Population Study of Gaseous Exoplanets.* The Astronomical Journal, 155(4), 156.
- **Tsiaras** et al. 2016. *Detection of an Atmosphere Around the Super-Earth 55 Cancri e.* The Astrophysical Journal, 820(2), 99.
- **Tsiaras** et al. 2016. *A New Approach to Analyzing HST Spatial Scans: The Transmission Spectrum of HD 209458 b.* The Astrophysical Journal, 832,(2) 202.

- Yip, Nikolaou, Coronica, **Tsiaras** et al. 2019. *Pushing the Limits of Exoplanet Discovery via Direct Imaging with Deep Learning*. ECML-PKDD conference.
- Tinetti et al. 2018. *A chemical survey of exoplanets with ARIEL*. Experimental Astronomy, 46(1), 135.
- Bean et al. 2018. *The Transiting Exoplanet Community Early Release Science Program for JWST*. Publications of the Astronomical Society of the Pacific, 130(993), 114.
- Varley, **Tsiaras** et al. 2017. *Wayne – A Simulator for HST WFC3 IR Grism Spectroscopy*. The Astrophysical Journal Supplement Series, 231(1), 13.
- Beatty, Madhusudhan, **Tsiaras** et al. 2017. *Evidence for Atmospheric Cold-trap Processes in the Non-inverted Emission Spectrum of Kepler-13Ab Using HST/WFC3*. The Astronomical Journal, 154(4), 158.
- Morello, **Tsiaras** et al. 2017. *High-precision Stellar Limb-darkening in Exoplanetary Transits*. The Astronomical Journal, 154(3), 111.
- Damiano, Morello, **Tsiaras** et al. 2017. *Near-IR Transmission Spectrum of HAT-P-32b using HST/WFC3*. The Astronomical Journal, 154(1), 39.

Articles under review

- **Tsiaras** et al. 2019. *Testing known and unknown systematics in HST/WFC3 spatial scans with the Wayne simulator*. Submitted to: The Astronomical Journal.
- Morello et al. 2019. *The ExoTETHyS package: Tools for Exoplanetary Transits around Host Starsr*. Submitted to: The Astronomical Journal.
- Yip, **Tsiaras** et al. 2018. *Integrating light-curve and atmospheric modelling of transiting exoplanets*. Submitted to: The Astronomical Journal.

Publicly available software developed

- *Iraclis*: Analysis pipeline for HST spectroscopic observations of exoplanet transits and eclipses.
- *Wayne*: Simulation of WFC3 observations.
- PyLightcurve: A python package for modeling and analysing transit light-curves.
- HOPS: A software to analyse data from small ground-based telescopes.
- TransitSimulator: Graphic interface for transit visualisation.
- ADSiLib: ADS Library Organiser.

Fellowships & Awards

- NASA Postdoctoral Fellowship. January 2018.
- Macedonian Prize, annual prize awarded to a greek citizen for achievements in science or art. Drama, Greece. October 2017.
- Honorable mention: 3rd International Olympiad on Astronomy and Astrophysics, Tehran, Iran. October 2009.
- 2nd prize: 14th Greek National Competition on Astronomy & Space, Volos, Greece. March 2009.
- 1st prize: Vasilis Xanthopoulos Mathematics-Physics Competition, Drama, Greece. March 2009.

Press releases

- First detection of water in the atmosphere of a habitable-zone planet: #197 out of the 13.5 million articles ever tracked by altmetric
- First detection of a super-Earth atmosphere: Hubble Space Telescope, European Space Agency, Europlanet, BBC, Nature, Forbes, Daily Mail, Washington Post, Time, Wired, Astronomy Now.
- First large catalogue of exoplanetary atmospheres: Europlanet (Press Release, Press Conference).

Teaching & Toutoring

- Invited lecturer on data analysis of exoplanet transits: 2016 – today.
  Aristotle University of Thessaloniki, Greece.

- MSc thesis co-supervisor:
  - James Ozden, University College London, UK. 2017 – 2018.
  - Yip Kai, University College London, UK. 2016 – 2017.
  - Konstantinos Karpouzas, Aristotle University of Thessaloniki, Greece and University College London, UK. 2016 – 2017.
- Undergraduate tutor:
  - Holomon Astronomical Station, Aristotle University of Thessaloniki, Greece. 2011 – 2016.
  - University College London Observatory, University College London, UK. 2016 – 2017.
- International Olympiad on Astronomy and Astrophysics (IOAA):
  - Invited scientific assistant for Greece: 11^{th} IOAA, Phuket, Thailand. November 2017.
  - Grader of the theoretical and data analysis tests: 7^{th} IOAA, Volos, Greece. August 2013.
  - Trainer of the students selected to represent Greece, especially on the subjects of data analysis, practical astronomy, celestial sphere and theoretical mechanics: 4^{th} (2010), 5^{th} (2011), 6^{th} (2012), 7^{th} (2013), 9^{th} (2015) and 10^{th} (2016) IOAA.

Outreach

- Several invitations for live discussions/interviews, e.g. Hubble hangouts, Event horizon
- 15+ talks and workshops for the general public in Greece and the UK since 2009.
- Leading member of outreach and citizen science projects (ExoClock, ExoWorlds Spies).
- Developer of user friendly software, made for amateur astronomers and the general public.
- Member of the Astronomy Education team at Royal Observatory Greenwich.

Skills

- Languages: Greek (native), English (proficient).
- Astronomical data analysis:
  - Observation planning – ground and space telescopes.
  - Photometric and spectroscopic data reduction and calibration – ground and space telescopes.
  - Time series analysis.
  - Exoplanet light curve and atmospheric modelling.
- Computing:
  - Operating systems: Mac OS (excellent), Linux (excellent), Windows (excellent).
  - Programming: Python (excellent, including GUI programming and web-applications with Django), HTML (good), R (good), C (basic).
  - Other: LaTeX (excellent), M. Office (excellent), Mathematica (excellent).
- Observing:
  - Telescope operator: $10'' - 11''$ (excellent, +400 hours).
  - Related software: MaxIm DL (excellent).
  - Targets: transiting exoplanets, eclipsing binaries, variable stars.

List of presentations

Invited seminars

- University of California, Berkeley, USA. October 2017.
- Aristotle University of Thessaloniki, Thessaloniki, Greece. February 2016.
- National Observatory of Athens, Athens, Greece. February 2016.

Invited oral presentations/workshops

- Pro-Am exoplanet observations workshop, Helsinki, Finland. April 2019.
- "Digital Exoplanets" meeting, Prague, Czech Republic. January 2019.
- International Symposium on Extra-Solar Planets, Bangalore, India. January 2019.
- PLATO 2.0 Citizen Planetentest, Kea, Greece. October 2018.
- 35^{th} Meeting of the Astronomical Society of India, Jaipur, India. March 2017.

Oral presentations (selected)

- European Planetary Science Congress 2019, Geneva, Switzerland. September 2019.
- 14$^{\text{th}}$ Hellenic Astronomical Conference, Volos, Greece. July 2019.
- European Planetary Science Congress 2018, Berlin, Germany. September 2018.
- "Spectroscopy of Exoplanets" Meeting, London, UK. July 2018.
- UK Exoplanet Community Meeting, Oxford, UK. March 2018.
- 49$^{\text{th}}$ Meeting of the AAS Division of Planetary Science, Provo, USA. October 2017.
- European Planetary Science Congress 2017, Riga, Latvia. September 2017.
- "Science with the Hubble and JWST V" conference, Venice, Italy. March 2017.
- 13$^{\text{th}}$ Hellenic Astronomical Conference, Herakleion, Greece. July 2017.
- 48$^{\text{th}}$ Meeting of the AAS Division of Planetary Science, Pasadena, USA. October 2016.
- National Astronomy Meeting 2016, Nottingham, UK. June 2016.
- 12$^{\text{th}}$ Hellenic Astronomical Conference, Thessaloniki, Greece. July 2015.