

# Dionysios Gakis

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## EDUCATION

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### **Doctor of Philosophy in Astronomy**

*The University of Texas at Austin*

Advisor: Prof. Keith Hawkins

August 2024 – Present

*Austin, TX*

### **Bachelor of Science in Physics (*entered 1<sup>st</sup> in overall class*)**

*University of Patras*

Final grade: 9.68/10

Degree thesis: Thermoelectric effects in neutron star crusts

September 2020 – July 2024

*Patras, Greece*

## RESEARCH EXPERIENCE

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### **National Observatory of Athens**

*Undergraduate Research Intern*

March 2024 – May 2024

*Athens, Greece*

- **Advisor:** Dr. Stavros Akras
- **Topic:** Observational analysis of low-ionization structures and photometric classification
- I processed data on low-ionization structures in planetary nebulae and analyzed multi-band photometric data from Aristarchos Telescope to classify candidates as planetary nebulae or symbiotic stars.
- **Technical skills:** SAOImageDS9, IRAF, astronomical image reduction

### **Academia Sinica Institute of Astronomy and Astrophysics**

*Undergraduate Research Intern (Summer Student Program)*

July 2022 – August 2022

*Remotely*

- **Advisor:** Dr. Rogério Monteiro-Oliveira
- **Topic:** Investigating environment effects in the Saraswati supercluster
- We mapped the luminous matter within the supercluster, assessed cluster spatial segregation by dynamical state and examined the central region's gravitational binding.
- **Technical skills:** R, Python, photometric data analysis, astronomical surveys, large-scale structure

### **Blue Marble Space Institute of Science**

*Visiting Scholar (NYUAD Mars Research Group)*

November 2021 – Present

*Remotely*

- **Advisor:** Dr. Dimitra Atri
- **Topic:** Analysis of the radiation environment of Mars
- Our analysis includes radiation mapping, material behavior study and search for biosignatures.
- **Technical skills:** Geant4, ROOT, space radiation analysis, human spaceflight

### **University of Patras, Department of Physics**

*Undergraduate Research Assistant (Theoretical Astrophysics Group)*

July 2021 – Present

*Patras, Greece*

- **Advisor:** Prof. Konstantinos N. Gourgouliatos
- **Topic:** Thermoelectric effects on the crust of neutron stars (March 2023 – Present)
- The suggestion of magnetic field amplification by temperature gradients is tested.
- **Technical skills:** Fortran, Biermann battery effect
- **Topic:** Gravitational dynamics of circumbinary systems (July 2021 – February 2023)
- Our study was aimed at describing orbits within Pluto's moon system and circumbinary exoplanetary systems.

- **Technical skills:** Python, n-body problem, Fourier analysis

**Blue Marble Space Institute of Science**  
**Research Associate** (*Young Scientist Program*)

May 2021 – October 2021  
*Remotely*

- **Advisor:** Dr. Dimitra Atri
- **Topic:** Radiation and its effects on astronaut health in long-term space missions
- My research was focused on modeling radiation on the surface of Mars and exploring ways to mitigate exposure.

## PUBLICATIONS

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View publications through [Google Scholar](#) and [NASA/ADS](#).

### Refereed Publications

- **D. Gakis** & D. Atri, "*Modeling the effectiveness of radiation shielding materials for astronaut protection on Mars*", The European Physical Journal Plus (2024), arXiv: 2205.13786.
- **D. Gakis** & K. N. Gourgouliatos, "*Revisiting thermoelectric effects in the crust of neutron stars*", Astronomy & Astrophysics (2024), arXiv: 2402.14911.
- **D. Gakis** & K. N. Gourgouliatos, "*Orbital analysis of the Pluto-Charon moon system's mutual interactions and forced frequencies*", Astronomy & Astrophysics 670, A152 (2023), arXiv: 2301.02260.
- **D. Gakis** & K. N. Gourgouliatos, "*Orbits of the TOI-1338 and TIC-172900988 systems*", Monthly Notices of the Royal Astronomical Society 519 (3), 3832-3842 (2023), arXiv: 2212.05016.
- **D. Gakis** & K. N. Gourgouliatos, "*Orbit determination of the moons of the Pluto-Charon system*", Celestial Mechanics and Dynamical Astronomy 134 (2), 14 (2022), arXiv: 2202.13319.

### Non-refereed Publications

- D. Atri et al. (including **D. Gakis**), "*Crewed Missions to Mars: Modeling the Impact of Astrophysical Charged Particles on Astronauts and Assessing Health Effects*", (2022), arXiv: 2208.00892.

## HONORS, AWARDS & SCHOLARSHIPS, SELECTED

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<b>Travel support grant</b> <i>COST Action: CA18104 - Revealing the Milky Way with Gaia; Vilnius, Lithuania &amp; Barcelona, Spain</i>	July 2023 & September 2023
<b>Travel support grant</b> <i>44<sup>th</sup> COSPAR Scientific Assembly; Athens, Greece</i>	July 2022
<b>Silver medal</b> <i>1<sup>st</sup> Global e-Competition in Astronomy &amp; Astrophysics</i>	October 2020
<b>Prize Scholarship</b> <i>The Great Moment for Education Initiative, Eurobank</i>	September 2020
<b>Bronze medal</b> <i>13<sup>th</sup> International Olympiad on Astronomy and Astrophysics; Keszthely, Hungary</i>	August 2019
<b>1<sup>st</sup> Prize</b> <i>National Olympiad on Physics</i>	April 2019
<b>Scientific Honor</b> <i>Awarded by the President of the Hellenic Republic for scientific excellence</i>	February 2019
<b>Honorable Mention</b> <i>12<sup>th</sup> International Olympiad on Astronomy and Astrophysics; Beijing, China</i>	November 2018

## CONFERENCE PRESENTATIONS

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- The Milky Way Revealed by Gaia: The Next Frontier Conference** September 2023
- Talk: "Impact, Inclusiveness and Outreach: Outputs from the MW-Gaia WG5 School"; Barcelona, Spain
- 2023 Asia-Pacific Regional IAU Meeting** August 2023
- Poster: "Is the massive Saraswati supercluster going to disappear in the future?" (non-presenting author); Koriyama, Japan
- 16<sup>th</sup> Hellenic Astronomical Conference** June 2023
- Poster: "Transit Timing Variations in exoplanetary systems through the ExoClock Project"; Athens, Greece
- 12<sup>th</sup> Hellenic Conference for Amateur Astronomers** October 2022
- Talk: "eclass.orionas.gr: Preparing students for astronomy competitions from the viewpoint of teacher assistants"; Patras, Greece
- 73<sup>rd</sup> International Astronautical Congress** September 2022
- Talk: "Radiation protection and shielding materials for crewed missions on the surface of Mars", arXiv: 2210.01061; Paris, France
- 44<sup>th</sup> COSPAR Scientific Assembly** July 2022
- Talk: "A study of the moon orbits in the Pluto-Charon system"; Athens, Greece
- 65<sup>th</sup> Open Readings Conference** March 2022
- Poster: "Regolith as radiation protective material for astronauts on Mars"; Online
- University of Aberdeen Aviation and Space Medicine Society Conference** February 2022
- Talk: "Cosmic radiation as a hazard for astronauts on the surface of Mars"; Online

## SEMINARS & WORKSHOPS

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- Code/Astro Workshop** July 2024
- Selected participant: Worked on astronomy software development (Northwestern University); Evanston, IL
- Kryoneri Observatory School** September 2023
- Selected participant: Worked on observational astrophysics; Kryoneri, Greece
- Petnica Summer Institute** August 2023
- Selected participant: Summer school focused on theoretical astrophysics; Petnica, Serbia
- MW-Gaia WG5 School** July 2023
- Selected participant: Topics related to improving inclusion and impact in the science process; Vilnius, Lithuania
- ASIAA Summer Program Seminar** August 2022
- Talk: "Investigating environment effects in the Saraswati supercluster"; Online
- Astromatic Summer School** August 2022
- Selected participant: Worked on artificial intelligence, machine learning, scientific computing and their applications on astrophysics (Université de Montréal); Montreal, Canada
- BlueSciCon Seminar** August 2021
- Talk: "Martian geological features as radiation protective shields"; Online

## SERVICE & VOLUNTEERING

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| <b>Local Organizing Committee Member</b>  | October 2022   |
| <ul style="list-style-type: none"><li>• 12<sup>th</sup> National Conference for Amateur Astronomers</li></ul>   |                |
| <b>Literature Group Member</b>  | 2022 – Present |
| <ul style="list-style-type: none"><li>• ExoClock Project; tasks include exoplanet literature checking and writing articles for newsletters.</li></ul>   |                |
| <b>Teaching volunteer</b>   | 2021 – Present |
| <ul style="list-style-type: none"><li>• Teaching and preparation of the national team, for participation in the International Olympiad on Astronomy and Astrophysics and the Junior International Olympiad on Astronomy and Astrophysics</li></ul>  |                |
| <b>Popular science writer</b>   | 2021 – Present |
| <ul style="list-style-type: none"><li>• Writing articles for <i>Sciworthy</i>, <i>Astrobit</i> explaining research in everyday language</li></ul>   |                |
| <b>Science outreach</b>   | 2021 – Present |
| <ul style="list-style-type: none"><li>• Co-organizing local public outreach astronomy events (talks, stargazing events, solar observations, school presentations)</li></ul>   |                |
| <b>Teacher assistant</b>  | 2019 – Present |
| <ul style="list-style-type: none"><li>• Volunteer for preparation of students for participation in the National Astronomy &amp; Space Engineering Olympiad. Teaching duties include student mentoring, material preparation and assignments' evaluation. Classes are provided by "Orion" Astronomy Society of Patras e-classroom.</li></ul> |                |

## MEDIA COVERAGE

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| <b>Online news</b>  | June 2022 |
| <ul style="list-style-type: none"><li>• Article by Universe Today</li></ul> |           |

## SKILLS

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- Computer skills**
- Operating systems: Linux, OS X, Windows
  - Programming languages: Python, C++, Fortran, R, MATLAB, HTML, SQL/ADQL, bash/shell
  - Tools: Git, GitHub
  - Software: IRAF, SAOImageDS9, TOPCAT, Geant4
  - Text processing: L<sup>A</sup>T<sub>E</sub>X, MS Office
- Languages**
- Greek (native), English (proficient), German (intermediate)
- Other skills**
- Observational Astronomy – Telescope Handling
  - Data analysis

## SOCIETIES

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- Space Generation Advisory Council (SGAC)
- Network of Researchers on the Chemical Evolution of Life (NoRCEL)
- "Orion" Astronomy Society of Patras; Secretary 2022-2024
- Student European Low Gravity Research Association (SELGRA)

## REFERENCES

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**Prof. Konstantinos N. Gourgouliatos**

University of Patras  
Department of Physics  
Patras, Greece  
kngourg@upatras.gr

**Dr. Rogério Monteiro-Oliveira**

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Institute of Astronomy and Astrophysics  
Taipei, Taiwan  
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**Dr. Dimitra Atri**

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Center for Space Science  
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**Dr. Stavros Akras**

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