

# Dionysios Gakis

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**GitHub:** <https://github.com/diongak>

## EDUCATION

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

August 2024 – Present

*The University of Texas at Austin*

*Austin, TX*

Advisor: Prof. Keith Hawkins

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

September 2020 – July 2024

*University of Patras*

*Patras, Greece*

Final grade: 9.68/10

Degree thesis: Thermoelectric effects in neutron star crusts

## RESEARCH EXPERIENCE

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### **The University of Texas at Austin, Department of Astronomy**

August 2024 – Present

*Graduate Research Assistant*

*Austin, TX*

- **Advisor:** Prof. Keith Hawkins
- **Topic:** Determining stellar P abundances
- I aim to measure phosphorus abundances of stars in the Milky Way' disk and accreted dwarf galaxy, using data from HPF and IGRINS instruments.
- **Technical skills:** stellar spectroscopy, nucleosynthesis, large surveys

### **National Observatory of Athens**

March 2024 – May 2024

*Undergraduate Research Intern*

*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**

July 2022 – August 2022

*Undergraduate Research Intern (Summer Student Program)*

*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**

November 2021 – July 2024

*Visiting Scholar (NYUAD Mars Research Group)*

*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 139 (8), 708 (2024), arXiv: 2205.13786.
- **D. Gakis** & K. N. Gourgouliatos, "*Revisiting thermoelectric effects in the crust of neutron stars*", Astronomy & Astrophysics 690, A117 (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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**Travel support grant**

July 2023 & September 2023

*COST Action: CA18104 - Revealing the Milky Way with Gaia; Vilnius, Lithuania & Barcelona, Spain*

**Travel support grant**

July 2022

*44<sup>th</sup> COSPAR Scientific Assembly; Athens, Greece*

**Silver medal**

October 2020

*1<sup>st</sup> Global e-Competition in Astronomy & Astrophysics*

**Prize Scholarship**

September 2020

*The Great Moment for Education Initiative, Eurobank*

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

## SEMINARS & WORKSHOPS

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<b>Stars, Planets and ISM Seminar (UT Austin)</b> • Talk: "Thermoelectric Effects in Neutron Star Crusts"; Austin, TX	September 2024
<b>Code/Astro Workshop</b> • Selected participant: Worked on astronomy software development (Northwestern University); Evanston, IL	July 2024
<b>Kryoneri Observatory School</b> • Selected participant: Worked on observational astrophysics; Kryoneri, Greece	September 2023
<b>Petnica Summer Institute</b> • Selected participant: Summer school focused on theoretical astrophysics; Petnica, Serbia	August 2023

<b>MW-Gaia WG5 School</b>	July 2023
<ul style="list-style-type: none"> <li>Selected participant: Topics related to improving inclusion and impact in the science process; Vilnius, Lithuania</li> </ul>	
<b>ASIAA Summer Program Seminar</b>	August 2022
<ul style="list-style-type: none"> <li>Talk: "Investigating environment effects in the Saraswati supercluster"; Online</li> </ul>	
<b>Astromatic Summer School</b>	August 2022
<ul style="list-style-type: none"> <li>Selected participant: Worked on artificial intelligence, machine learning, scientific computing and their applications on astrophysics (Université de Montréal); Montreal, Canada</li> </ul>	
<b>BlueSciCon Seminar</b>	August 2021
<ul style="list-style-type: none"> <li>Talk: "Martian geological features as radiation protective shields"; Online</li> </ul>	

## 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 Sciworthy, Astrobites 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>	August 2024
<ul style="list-style-type: none"> <li>Article by EurekAlert!</li> </ul>	
<b>Online news</b>	June 2022
<ul style="list-style-type: none"> <li>Article by Universe Today</li> </ul>	

## SKILLS

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<b>Computer skills</b>
<ul style="list-style-type: none"> <li>Operating systems: Linux, OS X, Windows</li> <li>Programming languages: Python, C++, Fortran, R, MATLAB, HTML, SQL/ADQL, bash/shell</li> <li>Tools: Git, GitHub</li> <li>Software: IRAF, SAOImageDS9, TOPCAT, Geant4</li> <li>Text processing: L<sup>A</sup>T<sub>E</sub>X, MS Office</li> </ul>

## 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**

Academia Sinica  
Institute of Astronomy and Astrophysics  
Taipei, Taiwan  
rmonteiro@asiaa.sinica.edu.tw

### **Dr. Dimitra Atri**

New York University Abu Dhabi  
Center for Space Science  
Abu Dhabi, UAE  
atri@nyu.edu

### **Dr. Stavros Akras**

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