

Dr. Georgios Valogiannis

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ACADEMIC AND PROFESSIONAL POSITIONS

SEPTEMBER 2023 <i>Present</i>	Eric and Wendy Schmidt AI in Science Postdoctoral Fellow , Department of Astronomy and Astrophysics, University of Chicago, IL, USA.
SEPTEMBER 2020 AUGUST 2023	Postdoctoral Research Fellow , Department of Physics, Harvard University, Cambridge, MA, USA. PI: Prof. Cora DVORKIN

EDUCATION

AUGUST 2014 AUGUST 2020	P.h.D. Astronomy , Department of Astronomy, Cornell University, Ithaca, NY, USA. Thesis title: “Testing Gravity with Cosmology: Efficient simulations, Novel Statistics and Analytical Approaches” Advisor: Prof. Rachel BEAN
MAY 2017	M.Sc. Astronomy , Department of Astronomy, Cornell University, Ithaca, NY, USA. Advisor: Prof. Rachel BEAN
SEPTEMBER 2009 MARCH 2014	B.Sc. Physics , Aristotle University of Thessaloniki, Thessaloniki, Greece. Thesis title: “Equilibrium Models of Magnetized Tori around Rotating Black Holes” Advisor: Prof. Nikolaos STERGIOULAS, GRADE: 10/10 Final Grade: 9.54/10 1 st place in Physics class of 2014
SEPTEMBER 2006 JULY 2009	Lyceum Alexandros Papadiamantis , Trikala, Greece. Final Grade: 19.8/20 1 st place in class of 2009

PUBLICATIONS

(* Student co-supervised)

1. A. G. Adame et al. (including **G. Valogiannis**), “*DESI 2024 VII: Cosmological Constraints from the Full-Shape Modeling of Clustering Measurements*”,
Under internal review, expected November (2024), arXiv:XXXX.XXXXX
2. M. Ishak, J. Pang, K. Lodha, R. Calderon, **G. Valogiannis** et al., “*Modified Gravity Constraints from the Full Shape Modeling of Clustering Measurements from DESI 2024*”,
Under internal review, expected November (2024), arXiv:XXXX.XXXXX
3. **G. Valogiannis**, F. Villaescusa-Navarro & M. Baldi, “*Towards unveiling the large-scale nature of gravity with the wavelet scattering transform*”,
JCAP in press, arXiv:2407.18647 , (2024)
4. **G. Valogiannis**, S. Yuan & C. Dvorkin, “*Precise Cosmological Constraints from BOSS Galaxy Clustering with a Simulation-Based Emulator of the Wavelet Scattering Transform*”,
Phys. Rev. D 109, 103503 (2024), arXiv:2310.16116
5. C. Cuesta-Lazaro et al. (including **G. Valogiannis**), “*SUNBIRD: A simulation-based model for full-shape density-split clustering*”,
Mon. Not. Roy. Astron. Soc. 531 (2024) 3, 3336-3356, arXiv:2309.16539
6. E. Paillas et al. (including **G. Valogiannis**), “*Cosmological constraints from density-split clustering in the BOSS CMASS galaxy sample*”,
Mon. Not. Roy. Astron. Soc. 531 (2024) 1, 898-918, arXiv:2309.16541
7. Y. Gouttenoire, S. Trifinopoulos, **G. Valogiannis** & M. Vanvlasselaer, “*Scrutinizing the Primordial Black Holes Interpretation of PTA Gravitational Waves and JWST Early Galaxies*”,
Phys. Rev. D 109, 123002 (2024), arXiv:2307.01457
8. **G. Valogiannis** & C. Dvorkin, “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”,
Phys. Rev. D 106, 103509 (2022), arXiv:2204.13717.
9. **G. Valogiannis** & C. Dvorkin, “*Towards an optimal estimation of cosmological parameters with the wavelet scattering transform*”,
Phys. Rev. D 105, 103534 (2022), arXiv:2108.07821.
10. B. S. Wright, A. S. Gupta, T. Baker & **G. Valogiannis**, “*Hi-COLA: Fast, approximate simulations of structure formation in Horndeski gravity*”,
JCAP 03 (2023) 040, arXiv:2209.01666.
11. *M. Howard, A. Kosowsky & **G. Valogiannis**, “*Galaxy Cluster Statistics in Modified Gravity Cosmologies*”,
Under review in Phys. Rev. D (2022), arXiv:2205.13015.
12. L. Vazsonyi, P. L. Taylor, **G. Valogiannis**, N. S. Ramachandra, A. Ferté & J. Rhodes, “*Constraining $f(R)$ gravity with a k -cut cosmic shear analysis of the Hyper Suprime-Cam first-year data*”,
Phys. Rev. D 104, 083527 (2021), arXiv:2107.10277.
13. *R. Liu , **G. Valogiannis** et al., “*Constraints on $f(R)$ and normal-branch Dvali-Gabadadze-Porrati modified gravity model parameters with cluster abundances and galaxy clustering*”,
Phys. Rev. D 104, 103519 (2021), arXiv:2101.08728.

14. A. Aviles, **G. Valogiannis** et al., “*Redshift space power spectrum beyond Einstein-de Sitter kernels*”,
JCAP 04 (2021) 039, arXiv:2012.05077.
15. S. Alam et al. (including **G. Valogiannis**), “*Towards testing the theory of gravity with DESI: summary statistics, model predictions and future simulation requirements*”,
JCAP 11 (2021) 11, 050, arXiv:2011.05771.
16. N. Ramachandra, **G. Valogiannis** et al., “*Matter Power Spectrum Emulator for $f(R)$ Modified Gravity Cosmologies*”,
Phys. Rev. D 103, 123525 (2021), arXiv:2010.00596.
17. **G. Valogiannis**, R. Bean & A. Aviles, “*An accurate perturbative approach to redshift space clustering of biased tracers in modified gravity*”,
JCAP 01 (2020) 055, arXiv:1909.05261.
18. M. Ishak, T. Baker, P. Bull, E. M. Pedersen, J. Blazek, P. G. Ferreira, C. D. Leonard, W. Lin, E. Linder, K. Pardo & **G. Valogiannis**, “*Modified Gravity and Dark Energy models Beyond $w(z)$ CDM Testable by LSST*”,
(2019), arXiv:1901.03763.
19. **G. Valogiannis** & R. Bean, “*Convolution Lagrangian perturbation theory for biased tracers beyond general relativity*”,
Phys. Rev. D 99, 063526 (2019), arXiv:1901.03763.
20. **G. Valogiannis** & R. Bean, “*Beyond δ : Tailoring marked statistics to reveal modified gravity*”,
Phys. Rev. D 97, 023535 (2018), arXiv:1708.05652
21. **G. Valogiannis** & R. Bean, “*Efficient simulations of large scale structure in modified gravity cosmologies with COLA*”,
Phys. Rev. D 95, 103515 (2017), arXiv:1612.06469

COLLABORATIONS

2016	Large Synoptic Survey Telescope Dark Energy Science Collaboration (LSST DESC) - Full Member
<i>Present</i>	Co-convenor of Modeling and Combined Probes (MCP) working group (2024-Present) Former leader of Beyond- $w(z)$ CDM Projects Topical Team (2020-2024)
2016	Dark Energy Scientific Instrument (DESI) Collaboration
<i>Present</i>	Co-convenor of Alternative Clustering Methods topical group (2024-Present) Galaxies & Quasars Clustering (GQC) working group
2016	Euclid Consortium (EC)
<i>Present</i>	Theory Working Group (TWG) Cosmological Simulations (CosmoSim) working group
2019	Nancy Grace Roman Space Telescope
2020	High Latitude Survey (HLS)
2020	Institute for Artificial Intelligence and Fundamental Interactions (IAIFI)
2023	Affiliate postdoctoral researcher
2024	SkAI Institute for Artificial Intelligence in Astronomy
<i>Present</i>	Affiliate postdoctoral researcher

SCHOLARSHIPS AND AWARDS

MARCH 2021	Best PhD thesis Prize - Emiliós Harlaftis Awarded by the Hellenic Astronomical Society (Hel.A.S.)
OCTOBER 2019	Best of Posters Award Cosmic Controversies Conference, University of Chicago/KICP, IL, USA
FEBRUARY 2017	LSST Dark Energy Science Collaboration (DESC) Travel grant DESC Collaboration meeting at SLAC National Accelerator Laboratory, CA
JULY 2010	Graduated 1 st in overall class in academic years 2009-2012 (State Scholarship Foundation (I.K.Y.) Scholarship of Excellence Holder)
OCT. 2009	1 st Winner Team competition 3 rd International Olympiad on Astronomy & Astrophysics, Tehran, Iran
OCT. 2009	Entered Physics Department 1 st in overall class (State Scholarship Foundation (I.K.Y.) Scholarship of Excellence Holder)
MAR. 2009	1 st Winner National Olympiad on Astronomy & Astrophysics, Volos, Greece
AUG. 2008	Honorable mention 2 nd International Olympiad on Astronomy & Astrophysics, Bandung, Indonesia

INVITED COLLOQUIA & SEMINARS

- (Invited) “*Going beyond the power spectrum: an analysis of BOSS galaxy data with wavelet scattering transforms*”, Institute for Astrophysics - FORTH, May 2024,
Astrophysics Seminar,
Herakleion, Crete, Greece
- (Invited) “*Overview of DESI Year-1 Cosmological Results*”, University of Chicago, May 2024,
High Energy Physics Lunch Seminar,
Chicago, IL, USA
- (Invited) “*Precise Cosmological Constraints from BOSS Galaxy Clustering with a Simulation-Based Emulator of the Wavelet Scattering Transform*”, Berkeley Center for Cosmological Physics,
January 2024,
Berkeley Center for Cosmological Physics (BCCP) Seminar,
Berkeley, CA, USA
- (Invited) “*Precise Cosmological Constraints from BOSS Galaxy Clustering with a Simulation-Based Emulator of the Wavelet Scattering Transform*”, Ohio State University, January 2024,
Center for Cosmology and AstroParticle Physics (CCAPP) Seminar,
Columbus, OH, USA
- (Invited) “*Precise Cosmological Constraints from BOSS Galaxy Clustering with a Simulation-Based Emulator of the Wavelet Scattering Transform*”, KICP, November 2023,
Survey Science Group Seminar,
Chicago, IL, USA
- (Invited) “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, Yale University, March 2023,
Astro x Data Science Seminar,
New Haven, CT, USA

- (Invited) “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, Perimeter Institute, January 2023,
Cosmology Seminar - Virtual
- (Invited) “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, Johns Hopkins University, September 2022,
Particle Theory Seminar,
Baltimore, MD, USA
- (Invited) “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, Euclid Consortium, June 2022,
Additional Galaxy Clustering Probes Working Group telecon - Virtual
- “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, Harvard Center for Astrophysics (CfA), June 2022,
Eisenstein Group meeting,
Cambridge, MA, USA
- (Invited) “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, École Normale Supérieure (ENS), May 2022,
Theoretical Astrophysics Seminar - Virtual
- (Invited) “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, Institute of Advanced Study (IAS), May 2022,
Cosmology Journal Club - Virtual
- (Invited) “*Towards an optimal estimation of cosmological parameters with the wavelet scattering transform*”, Stanford University, January 2021,
Abel Group meeting - Virtual
- “*Testing gravity with cosmology: efficient simulations, novel statistics and analytical approaches*”, Princeton University, November 2019,
Princeton, NJ, USA
- “*Testing gravity with cosmology: efficient simulations, novel statistics and analytical approaches*”, Carnegie Mellon University, October 2019,
Pittsburgh, PA, USA
- “*Testing gravity with cosmology: efficient simulations, novel statistics and analytical approaches*”, Argonne National Lab, October 2019,
Chicago, IL, USA
- “*Testing gravity with cosmology: efficient simulations, novel statistics and analytical approaches*”, Harvard Institute for Theory and Computation, September 2019,
Cambridge, MA, USA
- “*Testing gravity with cosmology: efficient simulations, novel statistics and analytical approaches*”, Berkeley Center for Cosmological Physics, September 2019,
Berkeley, CA, USA
- “*Testing gravity with cosmology: efficient simulations and novel statistics*”, Institute of Cosmology and Gravitation, April 2018,
Portsmouth, UK
- “*Testing gravity with cosmology: efficient simulations and novel statistics*”, University College London, April 2018,
London, UK

- “*Testing gravity with cosmology: efficient simulations and novel statistics*”, Durham University, April 2018, Durham, UK

CONFERENCE PRESENTATIONS

Talks

- “*Precise Cosmological Constraints from BOSS & DESI Galaxy Clustering using the Wavelet Scattering Transform*”, Cosmo24 Conference, October 2024, Kyoto, Japan
- “*Introduction to Generative AI*”, University of Chicago Schmidt Fellows Retreat, September 2024, Starved Rock, IL, USA
- “*Precise Cosmological Constraints from BOSS Galaxy Clustering using the Wavelet Scattering Transform*”, Cosmology in the Adriatic – From PT to AI Workshop, July 2024, Split, Croatia
- “*Precise Cosmological Constraints from BOSS & DESI Galaxy Clustering using the Wavelet Scattering Transform*”, New Strategies for Extracting Cosmology from Galaxy Surveys Workshop - 2nd edition, July 2024, Sesto, Seston, Italy
- “*Precise Cosmological Constraints from BOSS Galaxy Clustering with a Simulation-Based Emulator of the Wavelet Scattering Transform*”, DESI Collaboration Meeting, December 2023, Big Island, HI, USA
- “*Precise Cosmological Constraints from BOSS Galaxy Clustering with a Simulation-Based Emulator of the Wavelet Scattering Transform*”, Debating the Potential of Machine Learning in Astronomical Surveys, December 2023, New York, NY, USA
- “*Cosmological Constraints from DESI data using the Wavelet Scattering Transforms*”, DESI Collaboration Meeting, December 2022, Cancun, Mexico
- “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, VIII Essential Cosmology for the Next Generation, November 2022, Playa del Carmen, Mexico
- “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, Berkeley Center for Cosmological Physics summer workshop, July 2022, Vipolze, Slovenia
- “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, Cosmology from Home, July 2022, Virtual
- “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, DESI Collaboration Meeting, June 2022, Berkeley, CA, USA
- (Invited) “*Testing gravity with cosmology: efficient simulations, novel statistics and analytical approaches*”, 15th Hellenic Astronomical Conference, July 2021, Best PhD thesis Prize Presentation - Virtual

- (Invited) “*Testing gravity with cosmology: efficient simulations, novel statistics and analytical approaches*”, Dutch Theoretical Cosmology Meeting, April 2021, Virtual
- “*Matter power spectrum emulator for $f(R)$ modified gravity cosmologies*”, Dark Energy Science Collaboration Summer Virtual meeting, July 2020
- “*An accurate model for redshift space clustering of biased tracers in modified gravity theories*”, Best of posters presentation, Cosmic Controversies Conference, October 2019, University of Chicago/KICP, IL, USA
- “*Modeling redshift-space distortions for biased tracers in modified gravity*”, DESI Collaboration Meeting, July 2019, Lawrence Berkeley National Lab, Berkeley, CA, USA
- “*Convolution LPT for biased tracers in modified gravity*”, LSST DESC Winter Meeting, March 2019, UC Berkeley, Berkeley, CA, USA
- “*Testing gravity with cosmology: efficient simulations and novel statistics*”, Euclid Cosmological Simulations Meeting, October 2018, ICE, Barcelona, Spain
- “*Beyond δ : tailoring marked statistics to reveal modified gravity*”, Statistical challenges for large-scale structure in the era of LSST, April 2018, University of Oxford, UK
- “*Beyond δ : tailoring marked statistics to reveal modified gravity*”, LSST DESC Winter Meeting, February 2018, SLAC, CA, USA
- “*Efficient simulations in modified gravity cosmologies with COLA*”, Euclid Consortium Meeting, June 2017, University College London, UK

Posters

- “*Going Beyond the Galaxy Power Spectrum: an Analysis of BOSS Data with Wavelet Scattering Transforms*”, Statistical Challenges in 21st Century Cosmology - COSMO 21, May 2024, Chania, Crete, Greece
- “*An accurate model for redshift space clustering of biased tracers in modified gravity theories*”, Cosmic Controversies Conference, October 2019, University of Chicago/KICP, IL, USA
- “*Beyond δ : tailoring marked statistics to reveal modified gravity*”, COSMO 21 Conference, June 2018, Valencia, Spain
- “*Beyond δ : tailoring marked statistics to reveal modified gravity*”, LSST DESC Winter Meeting, February 2018, SLAC, CA, USA
- “*Beyond δ : tailoring marked statistics to reveal modified gravity*”, American Astronomical Society Winter Meeting, January 2018, Washington DC, USA

MENTORING & TEACHING EXPERIENCE

Mentoring

JUNE 2024 PRESENT	Summer Research Supervisor , Department of Astronomy and Astrophysics, University of Chicago, Chicago, IL, USA “ <i>Deciphering the properties of realistic galaxy mocks from the MICE simulations</i> ”, Kate Overdeck, together with Joshua Frieman
JUNE 2024 PRESENT	Graduate Thesis Co-Supervisor , Institute of Astrophysics - FORTH, University of Crete, Herakleion, Crete, Greece “ <i>A comparative study of wavelet-based techniques for cosmological parameter inference</i> ”, Andreas Tersenov, together with Jean-Luc Starck
SPRING 2022 PRESENT	Graduate Thesis Supervisor , Department of Physics, Harvard University, Cambridge, MA, USA “ <i>Wavelet Scattering Transform Applications to CMB Lensing</i> ”, Anmol Raina
SPRING 2020 PRESENT	Graduate Thesis Supervisor , Department of Physics and Astronomy, University of Pittsburgh, Pittsburgh, PA, USA “ <i>Galaxy Cluster Statistics in Modified Gravity Cosmologies</i> ”, Marcell Howard
SPRING 2019 FALL 2020	Undergraduate Thesis Supervisor , Department of Astronomy, Cornell University, Ithaca, NY, USA. “ <i>Forecasting gravity constraints with DESI/CMB</i> ”, Rayne Liu
SPRING 2017	Undergraduate Thesis Supervisor , Department of Astronomy, Cornell University, Ithaca, NY, USA. “ <i>Marked Correlation Statistics for Modified Gravity</i> ”, Avirukt Mittal

Teaching

FALL 2014	Teaching Assistant , Department of Astronomy, Cornell University, Ithaca, NY, USA. “Introduction to Astronomy 1101”
SPRING 2015	Teaching Assistant , Department of Astronomy, Cornell University, Ithaca, NY, USA. “Introduction to Astronomy 1102”
FALL 2016	Teaching Assistant , Department of Astronomy, Cornell University, Ithaca, NY, USA. “Introduction to Astronomy 1101”
SPRING 2017	Guest Lecturer , Department of Astronomy, Cornell University, Ithaca, NY, USA. “Introduction to Modern Cosmology”, Astro 4433
JUNE 2010-	Teaching Volunteer , Volos, Greece

JUNE 2013 | Greek Astronomy Association

- Teaching and preparation of the national team of Astrophysics, for participation in International Olympiad on Astronomy and Astrophysics (China 2010, Poland 2011, Brazil 2012, Greece 2013)

Grading

SPRING 2012 | **Grader at Aristotle University**
“Introduction to Modern Astronomy”

JULY 2013 | **Academic Personnel**, Volos, Greece
International Olympiad on Astronomy and Astrophysics (IOAA)

- Member of the Academic Committee in IOAA 2013 (Volunteer Jury)
- Grading all parts of the exam and examining students on the observational part of the exam

SERVICE & VOLUNTEERING

Reviewing Service

- Monthly Notices of the Royal Astronomical Society
- Physical Review D & Physical Review Letters
- The Astrophysical Journal
- Proceedings of the National Academy of Sciences

Professional Service

- Member of LSST Dark Energy Science Collaboration (DESC) membership committee (2021-2023)
- Nominated for member of LSST Dark Energy Science Collaboration (DESC) Collaboration Council (2023)
- Co-organizer of Harvard Cosmology Journal Club (2021-2023)
- Co-organizer of Schmidt AI in Science Journal Club (2024-Present)
- Co-organizer of Schmidt AI in Science Seminar Series (2024-Present)
- Co-organizer of Schmidt AI in Science Fellows Hackathon (May 2024)
- Co-organizer of Schmidt AI in Science Fellows' Annual Retreat (September 2024/25)
- Co-organizer of KICP Seminar Series (2024-Present)

Volunteering Service

- Volunteer in public outreach astronomy event for August 2017 solar eclipse, Fuertes Observatory, Cornell, Ithaca, NY, USA

- Volunteer for teaching and preparation of the Greek national team of Astrophysics, for participation in International Olympiad on Astronomy and Astrophysics (China 2010, Poland 2011, Brazil 2012, Greece 2013)
- Answering questions for “Ask an Astronomer” Cornell Outreach website
- Organizer of local public outreach astronomy event, May 2013, Trikala, Greece

Public Codes

- Public matter power spectrum emulator for modified gravity theories <https://github.com/LSSTDESC/mgemu> & <https://zenodo.org/record/4058880#.Y0W80uzMIkg>
- Public C++ code for calculation of Lagrangian perturbation theory kernels and two-point statistics for halos in various modified gravity theories https://github.com/CornellCosmology/bias_MG_LPT_products
- Public C++ code for calculation of the anisotropic redshift-space two-point function of halos in various modified gravity theories, using the Gaussian Streaming Model https://github.com/CornellCosmology/GSM_MG_products

SKILLS

Computer Skills

Programming Languages: C/C++, PYTHON, FORTRAN
 Mathematical Computing: MATHEMATICA, MATLAB
 Operating systems: OS X, LINUX
 Text processing: L^AT_EX, MS Word

Languages

GREEK: Native speaker ENGLISH: Proficient user GERMAN: Independent user

REFERENCES

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rbean@astro.cornell.edu

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