

Eleni Vardoulaki - CV

Contact Information **Argelander-Institut für Astronomie**,
University of Bonn, Auf dem Hügel 71, 53121, Bonn, Germany
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Research Interests Multi-wavelength studies of extragalactic radio sources; active galactic nuclei (AGN); quasars; radio structures; (U)LIRGs; IR/radio relation; local and high-redshift Universe; galaxy evolution; pattern recognition techniques
Observational Astrophysics with focus on study of galaxy evolution, in the optical, infrared, radio and X-ray wavelengths, at low- and high-redshift Universe. Study of active galactic nuclei (AGN), starburst galaxies, their role in galaxy evolution and comparison of their energetics and their role in galaxy evolution. Ultra-Luminous Infrared Galaxies (U-LIRGs). Study of infrared/radio relation in galaxies in the local Universe and at high redshifts. Study of the structure of galaxies with automatic methods, pattern recognition techniques and machine learning.

Education **University of Oxford**, Oxford, UK

DPhil., Astrophysics, 2003-2009

- Thesis Title: Understanding the nature of the faint radio-source population
- Advisor: Prof Steve Rawlings
- Thesis Examiners: Prof Katherine Blundell & Prof Philip Best

University of Ioannina, Ioannina, Greece

BSc, Physics, 1998-2002

- Distinction - **Rank: 2nd in class**
- Grade - 7.66/10
- Major: Astrophysics
- Thesis title: Seyfert galaxies, Active Galactic nuclei and comparison to Normal galaxies' (using IRAS data)
- Thesis advisor: Prof. Vassiliki Tsikoudi

Professional Experience **Argelander-Institut für Astronomie**, University of Bonn, Germany

Postdoctoral Researcher: Member of the international COSMOS collaboration. Study of AGN at radio wavelengths. Study of the infrared/radio relation in galaxies in the local and high-redshift Universe (in the COSMOS field) in relation to environment. Galaxy morphology in the optical (e.g. galfit) and radio wavelengths (e.g. pybdsim), as well as algorithms that automatically identify structures (pattern recognition) and use of machine learning techniques. Student supervision at undergraduate, masters and PhD levels.

October 2015 to present

University of Crete, Heraklion, Crete, Greece

Postdoctoral Researcher: Radio continuum properties of (Ultra)-Luminous Infrared Galaxies

February 2012 to June 2015

California Institute of Technology (Caltech), Pasadena, CA, USA

visiting Postdoctoral Researcher at the Infrared Processing and Analysis Center (IPAC)

May 2015

California Institute of Technology (Caltech), Pasadena, CA, USA

visiting Postdoctoral Researcher at the Infrared Processing and Analysis Center (IPAC)

March-April 2013

Centro de Astrofisica da Universidade do Porto, Porto, Portugal

Research Fellow: Astrophysics of Active Galactic Nuclei

September 2010 to December 2011

- Research on the stellar properties of the hosts of high-redshift active galactic nuclei

Observing experience

- August 2006: WHT telescope, La Palma, Canary Islands, Spain (3 nights of observing - optical spectroscopy)
- September 2005: McDonald observatory, Texas, USA (10 nights of observing and self-operating the telescope - optical spectroscopy)
- February 2005: UKIRT telescope, Hawaii, USA (6 nights of observing - near-infrared imaging)

Computing and data reduction

- Operating systems: Linux/Mac/Windows. Programming languages: Python, C, and Perl., Office applications and HTML.
- Experience in analysis of astronomical data using packages IRAF, AIPS, CASA and IDL.
- Galaxy morphology in the optical (e.g. galfit) and radio wavelengths (e.g. pybdsf).
- Data reduction and analysis in radio continuum surveys (VLA), in the optical (William Herschel Telescope, 2.7m McDonald Obs., HST) and in the infrared (UKIRT, Spitzer /IRAC/MIPS, Herschel)
- Use of machine learning algorithms for pattern recognition in astronomical imaging (e.g. SIANN, scikitlearn, tensorflow)

Student supervision

- November 2016-January 2017: Student supervision for the Astroseminar at the University of Bonn of the masters student (Thanh Dat Hoang) will present a recent publication from the archive. Publication: The Radio Spectral Energy Distribution and Star Formation Rate Calibration in Galaxies, Tabatabaei et al., 2016
- April 2016-now: Co-supervision of masters thesis in astrophysics at the University of Bonn. Research topic: 1) Radio spectral index maps of radio AGN in the COSMOS field between 1.4 and 3 GHz, and 2) data reduction from archival GMRT observations in the COSMOS field at 330 MHz, Vishnu Balakrishnan, Bonn, 2017
- April 2015-now: Co-supervision of masters thesis at the University of Bonn. Research topic: 1) Galaxy morphology in the COSMOS field; comparison of optical and radio structures, Nils Linz, Bonn, 2017

- October 2015-now: Co-supervision of PhD thesis in astrophysics at the University of Bonn. Research topic: 1) Size of star-forming galaxies in the radio in the COSMOS field, 2) study of a sub-mm galaxy at redshift above 4 with data in the optical, infrared, radio and ALMA, 3) code developing for semi-automatic pattern recognition of galaxies with complex radio structure in the COSMOS field, Eric Faustino Jimenez Andrade, Bonn, 2019
- October 2015-now: Co-supervision of PhD thesis in astrophysics at the University of Bonn. Research topic: 1) radio recombination lines in luminous infrared galaxies at low redshift, 2) developing of pipeline for optimising archival use of ALMA data (for the German ARC Node), 3) use of machine learning techniques for pattern recognition of complex radio structures, Toma Badescu, Bonn 2017
- October 2015-April 2016: Co-supervision of masters thesis in astrophysics at the University of Bonn with title "The Evolution of the FIR/Radio Correlation in the COSMOS Field", Christos Karoumpis, Bonn, 2016
- December 2015-April 2016: Co-supervision of undergraduate thesis in astrophysics at the University of Bonn with title 'Struktureigenschaften ferner Galaxien in der Karl G. Jansky VLA COSMOS Durchmusterung', Bianca Monika Hilger, Bonn, 2016

Internal examiner

February 2011: Principal investigator in master thesis defence, University of Porto

Public outreach

Interview on local TV channel regarding the solar eclipse of 2015

Complete study on the correct placement of a sundial in the city of Heraklion, Crete

Public talk for the 100 years of University of Porto (Winter 2011)

Public outreach for Oxford University, University of Porto and for the E-ELT (Summer 2010)

Author of article on Dark Matter, for a popular science portuguese newspaper

Telescope demonstrating for MacDonal Observatory (September 2005)

Publications in international journals

1. The VLA-COSMOS 3 GHz Large Project: Cosmic evolution of radio AGN and implications for radio-mode feedback since $z \sim 5$, (Smolcic, V., Novak, M., Delvecchio, I., Ceraj, L., Bondi, M., Delhaize, J., Marchesi, S., Murphy, E., Schinnerer, E., **Vardoulaki, E.** and G. Zamorani), 2016, A&A, 602, A6
2. The VLA-COSMOS 3 GHz Large Project: Multiwavelength counterparts and the composition of radio sources, (Smolcic, V., Zamorani, G., Delvecchio, I., Baran, N., Novak, M., Delhaize, J., Schinnerer, E., Berta, S., Bondi, M., Ciliegi, P., Capak, P., Civano, F., Karim, A., Le Fevre, O., Ilbert, O., Laigle, C., Marchesi, S., McCracken, H. J., Tasca, L., Salvato, M., and **Vardoulaki, E.**), 2016, A&A, 602, A2

3. The VLA-COSMOS 3 GHz Large Project: Continuum data and source catalog release, (Smolcic, V.; Novak, M.; Bondi, M.; Ciliegi, P.; Mooley, K. P.; Schinnerer, E.; Zamorani, G.; Navarette, F.; Bourke, S.; Karim, A.; **Vardoulaki, E.**, et al.), 2016, A&A, 602, A1
4. Radio continuum properties of luminous infrared galaxies. Identifying the presence of an AGN in the radio, (**Vardoulaki, E.**; Charmandaris, V.; Murphy, E. J.; Diaz-Santos, T.; Armus, L.; Evans, A.; Mazzarella, J. M.; Privon, G. C.; Stierwalt, S.; Barcos-Munoz, L.), 2015, A&A, 574, 4
5. Black-hole masses, accretion rates and hot- and cold-mode accretion in radio galaxies at $z \sim 1$, (Fernandes, C. A. C.; Jarvis, M. J.; Martinez-Sansigre, A.; Rawlings, S.; Afonso, J.; Hardcastle, M. J.; Lacy, M.; Stevens, J. A.; **Vardoulaki, E.**), 2015, MNRAS, 447, 1184
6. Evidence for a maximum jet efficiency for the most powerful radio galaxies, (Fernandes, C. A. C.; Jarvis, M. J.; Rawlings, S.; Martinez-Sansigre, A.; Hatziminaoglou, E.; Lacy, M.; Page, M. J.; Stevens, J. A.; **Vardoulaki, E.**), 2011, MNRAS, 411, 1909
7. The TexOx-1000 redshift survey of radio sources I: the TOOT00 region, (**Vardoulaki, Eleni**; Rawlings, Steve; Hill, Gary J.; Mauch, Tom; Inskip, Katherine J.; Riley, Julia; Brand, Kate; Croft, Steve; Willott, Chris J.), 2010, MNRAS, 401, 1709
8. Radio imaging of the Subaru/XMM-Newton Deep Field - II. The 37 brightest radio sources, (**Vardoulaki, Eleni**; Rawlings, Steve; Simpson, Chris; Bonfield, David G.; Ivison, R. J.; Ibar, Eduardo), 2008, MNRAS, 387, 505
9. Accretion indicators for the 37 brightest radio sources in the Subaru/XMM-Newton Deep Field, (**Vardoulaki, E.**; Rawlings, S.; Simpson, C.), 2007, NCimB, 122, 1029
10. The First Swift X-Ray Flash: The Faint Afterglow of XRF 050215B, (Levan, A. J.; Osborne, J. P.; Tanvir, N. R.; Page, K. L.; Rol, E.; Zhang, B.; Goad, M. R.; O'Brien, P. T.; Priddey, R. S.; Bersier, D.; Burrows, D. N.; Chapman, R.; Fruchter, A. S.; Giommi, P.; Gehrels, N.; Hughes, M. A.; Pak, S.; Simpson, C.; Tagliaferri, G.; **Vardoulaki, E.**), 2006, ApJ, 648, 1132
11. GRB 050215B: candidate afterglow, (Tanvir, N.; Pak, S.; Priddey, R.; Hughes, M.; Rol, E.; Levan, A.; O'Brien, P.; Simpson, C.; **Vardoulaki, E.**; Carroll, T.), 2005, GCN, 3031, 1

Publications in
conferences
proceedings with
referees

1. The Radio Continuum Properties of Luminous Infrared Galaxies, (**Vardoulaki, E.**; Charmandaris, V.; Armus, L.; Murphy, E. J.; Diaz-Santos, T.; Evans, A.), The 11th Hellenic Astronomical Conference, held 8-12 September, 2013 in Athens, Greece. Online at <http://www.helas.gr/conf/2013/>, pp.29-29
2. Radio Continuum Properties of Luminous IR Galaxies, (Charmandaris, Vassilis; **Vardoulaki, E.**; Armus, L.; Murphy, E. J.; Diaz Santos, T.; Evans, A. S.; GOALS Team), American Astronomical Society, AAS Meeting 221, id.157.04

3. Stellar luminosities and radio structures of radio sources, (**Vardoulaki, E.**), 10th Hellenic Astronomical Conference, Proceedings of the conference held at Ioannina, Greece, 5-8 September 2011. Edited by Iossif Papadakis and Anastasios Anastasiadis., pp.20-20
4. Probing accretion activity in radio sources using 24 micron Spitzer data, (**Vardoulaki, Eleni;** Rawlings, Steve; Simpson, Chris), Conference proceedings of "Galaxy Evolution with Spitzer and Herschel", Crete, May 2006
5. The TOOT00 redshift survey of radio sources, (**Vardoulaki, E.**; Rawlings, S.; Hill, G. J.; Croft, S.; Brand, K.; Riley, J.; Willott, C.), 2006, AN, 327, 282

Working papers

1. The VLA-COSMOS 3GHz Large Project: multi-component radio sources, (**Vardoulaki, E.**; Karim, A.; Smolcic, V.; et al. and the COSMOS Team)
2. The VLA-COSMOS 3GHz Large Project: the FR-type radio sources, (**Vardoulaki, E.**; Karim, A.; Smolcic, V.; et al. and the COSMOS Team)
3. Dissecting the IR/radio relation in the local Universe: environmental scope, (**Vardoulaki, E.**; Karim, A.; Magnelli, B.; Sargent, M.; Smolcic, V.; Schinnerer, E. et al.)
4. Dissecting the IR/radio relation in the COSMOS field: environmental scope, (**Vardoulaki, E.**; Karim, A.; Magnelli, B.; Sargent, M.; Smolcic, V.; Schinnerer, E. et al.)
5. Peculiar radio sources in the COSMOS field: analysis on the radio spectral indices, (Balakrishnan, V.; **Vardoulaki, E.**; Mooley, K. et al.)
6. Lyman continuum photon escape from FRI/FRII type radio AGN in the COSMOS field, (**Vardoulaki, E.**; Papaderos, P.; Gomes, J. M. et al.)
7. Spatial variations in the mid-IR/radio correlation in Luminous Infrared Galaxies, (**Vardoulaki, E.**; Charmandaris, V.; Murphy, E. J.; Diaz-Santos, T.; Armus, L., Appleton, P.; and the GOALS Team)
8. The stellar luminosities and radio structures of radio sources, (**Vardoulaki, E.**; Rawlings, S.; Mauch, T.; Hill, G. J.; Simpson, C.)

Student supervision
& Teaching
Experience

Argelander-Institut für Astronomie, Bonn, Germany

Student supervision

- Undergraduate, Master and PhD level

October 2015-present

Trinity College, Oxford, UK

	<i>Non-Stipendiary Lecturer in Astrophysics and Atmospheric Physics</i>	2009
	• Tutoring 4th year students	
	University College , Oxford, UK	
	<i>Non-Stipendiary Lecturer in Astrophysics and Atmospheric Physics</i>	2009
	• Tutoring 4th year students	
	The Queen's College , Oxford, UK	
	<i>Non-Stipendiary Lecturer in Astrophysics and Atmospheric Physics</i>	2006
	• Tutoring of 4th year students	
Conference Presentations, Seminars and Schools International Conferences	COSMOS meeting, Contribution: talk <i>Kyoto, Japan</i>	July 2017
	The 13th Hellenic Astronomical Conference, Contribution: talk/poster <i>Heraklion, Greece</i>	July 2017
	COSMOS RMS meeting, Contribution: talk <i>Heidelberg, Germany</i>	March 2017
	Escape of Lyman radiation from galactic labyrinths, Contribution: talk <i>Chania, Crete, Greece</i>	April 2016
	JVLA COSMOS meeting, Contribution: talk <i>Zagreb, Croatia</i>	February 2015
	The 12th Hellenic Astronomical Conference, Contribution: talk <i>Thessaloniki, Greece</i>	June 2015
	EWASS 2015, Contribution: talk <i>Tenerife, Spain</i>	June 2015
	Gas, Dust, and Star-Formation in Galaxies from the Local to Far Universe, Contribution: poster <i>Chania, Crete, Greece</i>	May 2015
	Multiwavelength-Surveys: Galaxy Formation and Evolution from the early universe to today, Contribution: poster <i>Dubrovnik, Croatia</i>	May 2014

The 11th Hellenic Astronomical Conference, Contribution: poster <i>Athens, Greece</i>	September 2013
A panchromatic view of galaxy evolution 30 years after IRAS, Contribution: talk <i>Cyprus</i>	June 2013
The Modern Radio Universe 2013, Contribution: poster <i>Bonn, Germany</i>	April 2013
Infrared and Submillimeter Probes of Gas in Galaxies: From the Milky Way to the Distant Universe, Contribution: poster <i>Pasadena, USA</i>	March 2013
221st Meeting of the American Astronomical Society, Contribution: poster <i>Long Beach, USA</i>	January 2013
The 10th Hellenic Astronomical Conference, Contribution: poster <i>Ioannina, Greece</i>	September 2011
Challenges in Infrared Extragalactic Astrophysics II, Contribution: poster <i>Agios Nikolaos, Greece</i>	September 2010
A century of Cosmology, Contribution: poster <i>Venice, Italy</i>	August 2007
The discovery of the Anisotropy of the Fossil Radiation of the Universe, by George F. Smoot, Nobel Prize of Physics 2006 <i>Paris, France</i>	December 2006
AstroGrid Science Workshope and RadioNet/Astro Grid workshop for radio data providers, <i>Oxford, UK</i>	December 2006
Studying Galaxy Evolution with Spitzer and Herschel, <i>Agios Nikolaos, Greece</i>	May 2006
Cosmology, galaxy formation and astro-particle physics on the pathway to the SKA, <i>Oxford, UK</i>	April 2006
High Redshift Radio Galaxies, Contribution: talk <i>Granada, Spain</i>	April 2005

	Conference on Lasers and their applications, FORTH <i>Heraklion, Greece</i>	June 2001
Seminars given in English	Seminar at University of Crete <i>Heraklion, Greece</i>	July 2017
	Seminar at the National Observatory of Athens, <i>Athens, Greece</i>	June 2017
	Seminar at the Max Planck Institute for Radio Astronomy, <i>Bonn, Germany</i>	May 2017
	Seminar at the National Observatory of Athens, <i>Athens, Greece</i>	December 2016
	Seminar at the Max Planck Institute for Radio Astronomy, <i>Bonn, Germany</i>	December 2016
	Seminar at the Max Planck Institute for Radio Astronomy, <i>Bonn, Germany</i>	April 2016
	Seminar at University of Crete <i>Heraklion, Greece</i>	March 2012
	Seminar at the National Observatory of Athens, <i>Athens, Greece</i>	April 2011
	Seminar at CAUP <i>Porto, Portugal</i>	April 2011
	Public outreach talk for the 150 years of University of Porto, <i>Porto, Portugal</i>	March 2011
	Seminar at Princeton University, <i>New Jersey, USA</i>	September 2010
	Seminar at University of Oxford, <i>Oxford, UK</i>	March 2010
	Seminar at University of Cardiff, <i>Cardiff, UK</i>	December 2007
	Seminar at University of Oxford, <i>Oxford, UK</i>	April 2005
	Seminar at University of Oxford, <i>Oxford, UK</i>	May 2004

Participations in seminars and schools

Seminar with title 'Managing RD Projects', Dr. Cristine Issa, University of Cologne, Cologne, Germany **October 2016**

Seminar with title 'Time- and Self-Mangement', Dr. Carrie B. Dohe, University of Cologne Cologne, Germany **October 2016**

Seminar with title 'Professional Presentations at Conferences and in the Academic World', Dr Carrie B. Dohe, University of Cologne Cologne, Germany **June 2016**

Seminar with title 'Self-Marketing for Female Scientists', Dr Cristine Issa, University of Cologne Cologne, Germany **April 2016**

Ninth Synthesis Imaging Summer School, New Mexico, USA **June 2004**

Summer School on Physics, University of Crete Heraklion, Greece **June 2002**

Awards

General Secretariat for Research and Technology, Greece

Post-Doctoral Research position supported by the Action "Supporting Postdoctoral Researchers" of the Operational Program "Education and Lifelong Learning" (Action's Beneficiary: General Secretariat for Research and Technology), and co-financed by the European Social Fund (ESF) and the Greek State, 2012-2015

Centro de Astrofisica da Universidade do Porto (CAUP), Portugal

Post-Doctoral Fellowship awarded by CAUP, 2010

St. Peter's College, Oxford, UK

Three travel grants awarded by St. Peter's College during DPhil studies

State Scholarships Foundation IKY, Greece

Award by the Greek scholarship foundation IKY for achieving 1st rank during the 3rd year of undergraduate studies, 2001

Award by the Greek scholarship foundation IKY for achieving 1st rank during the 1st year of undergraduate studies, 1999

Languages

- Greek: Native speaker
- English: Fluent & Proficiency from Cambridge University
- Portuguese: Basic
- French: Basic
- German: Basic

Affiliations

Member of the international collaboration COSMOS since 2015

Member of the Hellenic Astronomical Society since 2010

References

Prof Frank Bertoldi
Argelander-Institut für Astronomie
bertoldi@astro.uni-bonn.de

Prof Vassilis Charmandaris
University of Crete
charmandaris@noa.gr

Dr Polychronis Papaderos
Centro de Astrofísica da Universidade do Porto
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Dr Lee Armus
California Institute of Technology
lee@ipac.caltech.edu