

# MOEIN MOSLEH

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## education

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2009- 2013 PhD in Astrophysics, Leiden University, Netherlands  
Thesis: The Stellar Mass-Size Evolution of Galaxies from  $z = 7$  to  $z = 0$   
Advisor: Prof. Marijn Franx  
Co-Advisor: Dr. Rik Williams  
Funded by the Marie Curie Initial Training Network (ELIXIR) of the European Commission

2006-2007 Msc. in Astrophysics, University of Sussex, UK  
With Merit  
Thesis: Extraction of Luminous Red Galaxies From the Dark Energy Survey (DES) Simulation  
Advisor: Dr. A. Kathy Romer

1998-2002 Bsc. in Physics, Shiraz University, Iran  
Project: Photometry of  $\delta$  scuti stars.  
Project Advisors: Prof. N. Riazi

## work experiences

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2017- Present Director of Biruni Observatory, Shiraz University, Shiraz, Iran  
2017- Present Assistant Professor, Shiraz University, Shiraz, Iran  
2016- 2017 Post Doctoral Research Fellow, Shiraz University, Shiraz, Iran  
2013- 2016 Post Doctoral Research Fellow, School of Astronomy, IPM, Tehran, Iran

## research interest

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### Topics

Galaxy Evolution, Galaxy Structure, High-Redshift Galaxies, Lyman Break Galaxies, Star forming/Quiescent Galaxies, Active Galactic Nuclei, Galaxy Clustering, SED modelling, Star Formation Rate and Quenching, Comparing Observations and Simulations

## research projects

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### Recent Research Projects

Shiraz University & School of Astronomy, Iran (Dec. 2013 - Present):

- Studying the stellar mass profile evolution and structural formation of galaxies with time. Using a new approach to derive PSF and M/L corrected stellar mass profiles of galaxies from  $z=2$  to the present, and study the evolution of half-mass radii, central density and surface density of quiescent and star-forming galaxies from the 3D-HST and SDSS catalogs.

- Studies of the relation between structure and quenching of Galaxies since  $z=2$ . Using stellar mass central/surface density to find a better correlation between mass distributions within galaxies with their star-formation activity at different epochs of the Universe.
- Studying the formation of quiescent and Elliptical galaxies in the isolated environments of Voids in the local Universe and comparing to their analogues at dense group/cluster environments.
- Deriving Stellar mass map distributions of galaxies in the local Universe. To study 2-dimensional mass maps of galaxies, which allows to investigate mass morphology, merger history and central densities of galaxies at different environments.
- Studying initial mass function (IMF) of local galaxies at different environments, using spectra from SDSS.

## PhD Projects

Leiden Observatory, The Netherlands (Jan 2009- June 2013) :

- Studies of how structural properties of galaxies such as their sizes and surface brightness profiles and other physical properties change with time. In particular, studying the evolution of size-mass relation of galaxies with redshift ( $z \sim 0 - 7$ )
- Reduction of near-IR data (e.g. J & K bands), such as quality verification, flat-fielding, bad-pixel correction, sky subtraction, distortion correction, registration etc.

## Project with Galaxy Zoo team

Visiting Researcher, University of Sussex, United Kingdom (Oct. 2007- Dec. 2008) :

Studies the environment and properties of Red Spiral galaxies in collaboration of Dr. Kathy Romer (Sussex University) and Prof. Robert C. Nichol (ICG) and Galaxy Zoo team. This was an investigation about why star formation is truncated in these galaxies.

## Msc. Project

Master Thesis, University of Sussex, United Kingdom (Oct 2006-Sept 2007):

Construction of mock catalogues of luminous red galaxies (LRGs) from the DES (Dark Energy Survey) Simulation Catalogues. These catalogues further used to improve and optimize the forecast measurements of baryon acoustic oscillations (BAO) and the cosmological distance scale at high redshifts.

## Projects at Biruni Observatory

Visiting Researcher, Biruni Observatory, Shiraz University, Iran (Sep 2002 – Aug. 2006):

Supervisor: Prof. N. Riazi

- BVR differential photometry of eclipsing binary stars with 20" Cassegrain telescope equipped with photomultiplier tube up to more than 70 nights of observations during a period of five years.
- Obtained practical experiences (more than 100 nights of observation) and wrote a book on the techniques of CCD imaging, image processing and CCD photometry at a level for undergraduate students and advanced amateurs which has been published in 2006 (in Persian).

## publications

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- Galaxy Sizes Since  $z = 2$  from the Perspective of Stellar Mass Distribution within Galaxies, [Moein Mosleh](#), Shiva Hosseinejad, Zahra Hosseini-Shahisavandi, Sandro Tacchella, 2020, The Astrophysical Journal, 905, 107M
- Comparing IMF-sensitive indices of intermediate-mass quiescent galaxies in various environments, Elham Eftekhari, [Moein Mosleh](#), Alejandro Vazdekis, Saeed Tavasoli, 2019, MNRAS, 486, 3788
- Stellar Mass Profiles of Quiescent Galaxies in Different Environments at  $z \sim 0$ , [Moein Mosleh](#), Saeed Tavasoli, Sandro Tacchella, 2018, The Astrophysical Journal, 861, 101
- Connection Between Stellar Mass Distributions within Galaxies and Quenching Since  $z=2$ , [Moein Mosleh](#), Sandro Tacchella, Alvio Renzini, Marcella Carollo, Alireza Molaeinezhad, Masato Onodera, Habib Khosroshahi, Simon Lilly, 2017, The Astrophysical Journal, 837, 2
- On The Robustness of  $z = 0 - 1$  Galaxy Size Measurements Through Model and Non-Parametric Fits, [Moein Mosleh](#), Rik Williams, Marijn Franx, 2013, The Astrophysical Journal, 777, 117

- The Evolution of Mass-Size Relation for Lyman Break Galaxies from  $z=1$  to  $z=7$ ,  
Mosleh, M., Williams, R. J., Franx, M., Gonzalez, V., Bouwens, R., Oesch, P., Labbe, I., Illingworth, G., Trenti, M., 2012, The Astrophysical Journal Letters, 756, L12
- The Evolution of the Mass-Size Relation to  $z=3.5$  for UV-bright Galaxies and Submillimeter Galaxies in the GOODS-North Field,  
Moein Mosleh, Rik J. Williams, Marijn Franx, Mariska Kriek, 2011, The Astrophysical Journal, 727, 5
- Galaxy Zoo: Passive Red Spirals,  
Karen L. Masters, Moein Mosleh, A. Kathy Romer, Robert C. Nichol, Steven Bamford, Kevin Schawinski, Chris J. Lintott, Dan Andreescu, Heather C. Campbell, Ben Crowcroft, Isabelle Doyle, Edward M. Edmondson, Phil Murrar, M. Jordan Raddick, Anze Slosar, Alexander S. Szalay and Jan Vandenberg. 2010, MNRAS, 405, 783M
- Galaxy Zoo: Dust in Spirals,  
Masters, Karen L., Nichol, Robert C., Bamford, Steven, Mosleh, Moein, Lintott, Chris J., Andreescu, Dan, Edmondson, Edward M., Keel, William C., Murray, Phil, Raddick, M. Jordan, Schawinski, Kevin, Slosar, Anze, Szalay, Alexander S., Thomas, Daniel, Vandenberg, Jan., 2010, MNRAS, 404, 792M
- Apsidal Motion Study of the Eclipsing Binary Star V459 Cas,  
Dariush, Ali, Mosleh, Moein, Dariush Dena, 2006, Astrophys. & Space Sci., 305, 27.
- Times of Minima of Eclipsing Binary Systems DO Cas, V1143 Cyg, GO Cyg and VW Cep,  
Dariush, A.; Zabihinpoor, S.M.; Bagheri, M.R.; Jafarzadeh, S.H.; Mosleh, M., Riazi, N., 2003, IBVS, 5456, 1D.

#### publications in preparation \_\_\_\_\_

- Stellar Mass Assembly of Milky-Way Type Galaxies  
Maryam Hasheminia, Moein Mosleh, et al., 2021 in Preparation
- Evolution of SFR profiles of galaxies between 0.5-1.2,  
Moein Mosleh, Zahra Hosseini Shahi-Savandi, et al., 2021 in Preparation

#### book \_\_\_\_\_

- Digital Imaging & Astronomical Image Processing,  
Moein Mosleh, 2006, Avand Andisheh Publication, Iran  
ISBN: 964-8411-16-6; In 7 Chapters, 264 Pages, in Persian

#### research/work skills \_\_\_\_\_

##### Data Analysis & Scientific Programming

- Utilize query languages (e.g., SQL) to extract data. Validate data from all resources for accuracy purposes.
- Write/develop computer programs (in IDL, Python, Matlab) and use data mining techniques to analyse large and complex data sets.
- Evaluate and interpret data sets to gain accurate and deep insights of data.
- Apply modelling techniques to identify underlying trends and patterns of data quantities.
- Fit and test models/functions, Error analysis, Making Plots/Figures.

##### Image Processing

Digital Image Processing Techniques Including:

- Enhancement: Registration, Calibration, Correction, Optimization, Filtering, Stacking
- Analysis: Visualization, Feature Extraction, Segmentation, Quantitative Measurements, Interpretation, Studying Morphology/Shape & Classifications of objects based on their 2D images
- Archiving, Retrieving
- Processing low-level intensity/noisy images

- Experienced with Optical and Near-IR images

## Experimental Experience

- Extensive experience in working with light detectors (Photomultiplier Tube/CCD/CMOS) & telescopes.
- Introduce and develop CCD imaging/photometry techniques.
- Processing near-infrared images as well as data observed by Hubble Space Telescope.
- Initiative to set up an experiment for Laser beam transmission via water. Experiences on utilizing Lasers and alignment of optics.

## Writing Scientific Articles & Proposals

Publishing the scientific results in peer review journals including The Astrophysical Journal (ApJ) and Monthly Notices of the Royal Astronomical Society (MNRAS), with more than 270 citations.

## Writing & Translating Books

I wrote a book on the techniques of CCD imaging, image processing and CCD photometry at a level of undergraduate students and advanced amateurs which was published in 2006 (in Persian).  
Translating a book in Astronomy at the level of undergraduate students from English to Persian.

## Presentations

Poster presentations and delivering talks at workshops, international meetings and schools. Public lectures on Astronomy to general audiences at Amateur Astronomy Clubs.

## Organizing Workshops/Conferences

Organizer, co-organizer and speaker of the following workshops:

- Introduction to IDL (Interactive Data Language): SoA, IPM, June 2014
- Introduction to Galaxies (I): SoA, IPM, September 2014
- Introduction to Galaxies (II): SoA, IPM, November 2014
- Python for Astronomers: SoA, IPM, December 2014
- Galaxies Inside & out international workshop, SoA, IPM, January 2015
- Traces of Galaxy Formation, Biruni Observatory, Shiraz, March 2017
- Science with Small Telescopes workshop, Biruni Observatory, Shiraz, Sep. 2017

## Teaching Experiences & Assistant

Teaching assistant experience with graduate and undergraduate students:

- Teaching Observational Astrophysics & Cosmology, graduate course, Shiraz University
- Teaching Astrophysics, undergraduate course, Shiraz University
- Teaching History & Philosophy of Physics, undergraduate course, Shiraz University
- Teaching Physics I, undergraduate course, Shiraz University
- Teaching at National winter School of Astronomy at Zahedan, Iran, Feb, 2019
- Teaching at National winter School of Astronomy at Zahedan, Iran, Feb, 2017
- Teaching at National winter School of Astronomy at Zahedan, Iran, Feb, 2016
- Teaching at Cosmology & Gravity School, Shahid Beheshti University, Jan, 2015
- Teaching Assistant of Stellar Dynamics Course, Leiden Observatory, NL, 2011
- Teaching Assistant of Fundamental Physics at International Summer School, Sussex University, UK, 2008
- Public lectures on Astronomy at Biruni Observatory, Shiraz, Iran, 2000-2005

## Supervising Graduate Students

Supervising and being Co-advisor of Msc. students, IPM, Iran, 2013-2016:

- Co-advisors: Faezeh Aghaei (Msc. Amirkabir University of Technology, 2015)
- Supervisor: Arefeh Khoshbakht Marvi (Msc. Amirkabir University of Technology, 2015)
- Supervisor: Elham Eftekhari (Msc. Amirkabir University of Technology, 2017)
- Supervisor: Shiva Hosseini (Msc. Shiraz University, 2018)
- Supervisor: Zahra Hosseini Shahi-Savandi (Msc. Shiraz University, expected 2019)

## Communication & Team Working

Collaboration with several research groups in the Switzerland, Italy, UK, Netherlands, Spain and US. These collaborations include the responsibility to complete research, report and discuss the results in weekly (Telecon/Skycon) meetings and publish the results in the peer review Journals.

## Referee/Reviewer

Refereeing Journal articles of The Astrophysical Journal (ApJ) and reviewer of the Observing Proposals.

## working visits

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I have also been a visiting researcher at the following institutes:

- 2015 ETH Zurich, Switzerland  
Research Collaboration with Prof. Marcella Carollo & Prof. Simon Lilly
- 2014 Observing with INT 2.5 telescope, La Palma, Spain
- 2012 Carnegie Observatories, CA, US  
Research Collaborations with Dr. Rik Williams  
Accomplished: A paper to be appear in The Astrophysical Journal
- 2007-2008 University of Sussex & ICG Portsmouth, UK  
Research Collaborations with the Galaxy Zoo team  
Accomplished: Two papers in the peer review journal of MNRAS
- 2002-2006 Biruni Observatory, Shiraz University, Iran  
Photometry & CCD Imaging, collaborations with Prof. N. Riazi  
Accomplished: Publication of a book on CCD Imaging & image processing  
A paper published in the Astrophysics & Space Science

## grants and awards

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- Marie Curie Initial Training Network (ELIXIR) Fellowship to study in The Netherlands 2009-2012
- Awarded grants for travelling to USA (Research Collaboration), \$10,000 2012

## computer skills

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### Astronomy

Proficient in IRAF, GALFIT (Size & Morphologies of Galaxies), SExtractor, Stellar Population Modeling; FAST, iSEDfit, MAGPHYS, EAZY (Photometric-Redshift measurements)

### Scripting Languages

Programming with IDL (Interactive Data Language), Matlab, Python, for data analysis, Error analysis, Image processing, Plotting (Working in Unix/Linux environment). Basic knowledge of programming in C.

### Data Base Search

Using Structured Query Language (SQL) to extract proper information and tables of data from large data

bases/catalogues (SDSS, CFHT, IRSA, NVASS). Utilize Excel, Topcat (Interactive graphic data viewers and editor)

## Applications:

Writing documents in L<sup>A</sup>T<sub>E</sub>X, Microsoft Office

## conference & workshop attendance ---

Feb 2019	IPM, Baryons in Galaxies and beyond, Tehran, Iran
June 2016	ICTP, Summer School & Workshop on Cosmology, Trieste, Italy
May 2016	IASBS, 19th meeting on Research in Astronomy, Zanjan (Invited)
Feb 2016	National Astronomy Conference, Zahedan, Iran (Invited)
October 2015	Armenian-Iranian Astronomical Workshop, Armenia (talk)
September 2015	Zwicky Symposium, Braunwald, Switzerland (talk)
May 2015	IASBS, 18th meeting on Research in Astronomy, Zanjan (Invited)
May 2015	IPM, 22nd Physics Spring Conference, Tehran, (Invited)
January 2014	Galaxies inside and out workshop, IPM, Tehran (talk)
February 2014	National Astronomy Conference, Kerman, Iran (Invited)
September 2012	3rd ELIXIR School: Simulations of NIRSspec Observations, ESTEC, NL
October 2011	Second ELIXIR meeting, Madrid, Spain (talk)
July 2011	New Horizon for High Redshifts, Cambridge IoA, UK (poster)
July 2011	Galaxy Formation, Durham, UK (poster)
May 2011	Second ELIXIR School: How does a space project work?, ESA/ESTEC, Noordwijk, NL
September 2010	Summer School: First Stars and Cosmic Reionization, Heidelberg, Germany
July 2010	Oort Workshop: Emergence of Hubble Sequence $1 < z < 3$ , Leiden Observatory, NL
June 2010	First ELIXIR school: The JWST/NIRSspec Project, Astrium, Germany
May 2010	NAC 2010: 65th Dutch Astronomy Conference, Nijmegen, NL
December 2009	First ELIXIR meeting, Oxford, UK (talk)
November 2009	Evolution of Galaxies from Mass-Selected samples, Lorentz Center, Leiden , NL (talk)
October 2009	NOVA fall school, Netherlands
September 2009	Galaxy Zoo II meeting, ICG, Portsmouth, UK
February 2009	Deep IR Studies of Distant Universe, Loretz Center, Leiden, NL (talk)
September 2007	International DES (Dark Energy Survey) Collaboration Meeting, UCL, London, UK

## interests ---

Photography, PhotoBlogger, Photo & Movie Editing: [moeinmosleh.com](http://moeinmosleh.com)

Calligraphy: Trained for 3 years at the First Iranian Calligraphy Association

## languages ---

English · Fluent

Persian · Native Speaker

Dutch · Basic

## references ---

- Prof. Marijn Franx  
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- Dr. A. Kathy Romer  
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