

IASBS(Institute for Advanced Studies in Basic Sciences)
No. 444, Prof. Sobouti Blvd., 45137-66731 Zanjan, Iran

+98 914 314 9936

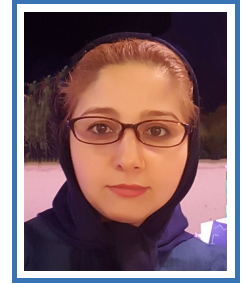
+98 (24) 3315 2114

+98 (24) 3315 5142

erfani@iasbs.ac.ir

<https://iasbs.ac.ir/~erfani/>

Date of Birth: 14 Sep. 1981



Encieh Erfani

Assistant Professor

Current Position

Dec. 2015 – present **Assistant Professor**, IASBS (Institute for Advanced Studies in Basic Sciences), Zanjan, Iran.

Past Positions

Jun. 2015 – Nov. 2015 **Visitor**, ICTP-SAIFR, São Paulo, Brazil (under TWAS Fellowship).

Oct. 2012 – May 2015 **Post Doctoral Fellow**, IPM (Institute for Research in Fundamental Sciences), Tehran, Iran.

Research Interests

- Early Universe Cosmology
- Primordial Black Holes
- Inflationary Models
- Machine Learning

Education

Nov. 2008 – Sep. 2012 **Ph.D., Theoretical Astro-Particle Physics**, Physikalisches Institut der Universität Bonn, Bonn, Germany.

Thesis *Inflation and Dark Matter Primordial Black Holes*

Supervisor Manuel Drees

Sep. 2007 – Aug. 2008 **Postgraduate Diploma, High Energy Physics**, ICTP, Trieste, Italy.

Thesis *The Standard Model Higgs Boson as the Inflaton?*

Supervisor Paolo Creminelli

Oct. 2003 – Feb. 2006 **M.Sc., Physics (Gravitation)**, Azerbaijan Shahid Madani University, Tabriz, Iran.

Thesis *A Review on Brane Cosmology*

Supervisors Farhad Darabi, Hamid Reza Sep.angi (Shahid Beheshti Uni., Tehran, Iran)

Oct. 1999 – Jul. 2003 **B.Sc., Physics**, Tabriz University, Tabriz, Iran.

Honors

Oct. 2019 **16th STS Forum**, Kyoto, Japan.

Jul. 2019 **Founder of "Knowledge Helper Fund"**.

2019 – present **OWSD full member**.

2018 – 2022 **TWAS Young Affiliate (TYAN)**.

2017 – 2022 **Junior Associate of ICTP, Italy**.

Nov. 2017 **World Science Forum**, Dead Sea, Jordan.

- 2015 **TWAS 2015 Fellowship for Research and Advanced Training.**
- 2014 **TWAS 2014 Fellowship for Research and Advanced Training.**
- 2012 – 2015 **IPM (Institute for Research in Fundamental Sciences) Fellowship.**
- 2009 – 2012 **BCGS (Bonn-Cologne Graduate School) Scholarship.**
- 2007 – 2008 **ICTP High Energy Physics Postgraduate Diploma Programme Scholarship.**

Professional Service

- 27 – 28 Feb. 2021 **Scientific Committee Member of Meeting on Gravity and Cosmology, Shahid Beheshti Uni., Iran.**
- 21 Jun. 2020 **Expert in “Solar Eclipse” live TV , Kias Island, Iran.**
- 30 Dec. 2019 **Organizer of the IYPT (International Year of the Periodic Table) Day, IASBS, Iran.**
- 26 Dec. 2019 **Expert in “Solar Eclipse” live TV , Kias Island, Iran.**
- Oct. 2019 – Feb. 2020 **Expert in “A Guide to Galactic Travelers” Telecast, (Mars I & II, Saturn, Farewell to the Solar System).**
- 11 Nov. 2019 **Organizer of the Transit of Mercury Workshop and Observation, IASBS, Iran.**
- Oct. 2018 – Dec. 2019 **Head of the Observatory, IASBS, Iran.**
- May 2019 **May 2019, Organizer of the “Appreciation of Astronomy Veterans of Iran”, IASBS, Iran , IASBS, Iran.**
- Jun. 2018 – present **Member of the editorial board of the “Encyclopedia of Young People”, Iran.**
- May 2018 **Co-chair of the 21st Meeting on Research in Astronomy, IASBS, Zanjan, Iran.**
- Mar. 2018 **Co-organizer of the first workshop in Physics (PWF), Kabul Uni., Afghanistan.**
- Feb. 2017 **Organizer of Cosmology and Gravitation Conference, IASBS, Zanjan, Iran.**
- Oct. 2016 – Jun. 2018 **Organizer of Physics Colloquiums, IASBS, Zanjan, Iran.**
- Jun. 2016 – Jun. 2017 **Associate Editor, African Review of Physics, ICTP, Trieste, Italy.**
- May 2016 **Organizer of the 19th Meeting on Research in Astronomy, IASBS, Iran.**
- May 2015 **Organizer of the 22nd IPM Physics Spring Conference, IPM, Tehran, Iran.**
- Apr. 2014 – Apr. 2015 **Organizer of High Energy Physics Weekly Seminars, IPM, Tehran, Iran.**
- Oct. 2012 – May 2015 **Organizer of Invisibles Network Journal Club, IPM, Tehran, Iran.**

Publications

- **Encieh Erfani**, Hamed Kameli and Shant Baghran, *Primordial Black Holes in the Excursion Set Theory*, arXiv:2101.07812.
- **Encieh Erfani**, *Primordial Black Holes Formation from Particle Production during Inflation*, JCAP 1604 (2016) 020 [arXiv:1511.08470].
- **Encieh Erfani**, *Modulated Inflation Models and Primordial Black Holes*, PRD 89 (2014) 083511 [arXiv:1311.3090].
- Azadeh Maleknejad and **Encieh Erfani**, *Chromo-Natural Model in Anisotropic Background*, JCAP 1403 (2014) 016 [arXiv:1311.3361].
- **Encieh Erfani**, *Axiology*, PoS Corfu2012 (2013) 062.
- Athanasios Chatzistavrakidis, **Encieh Erfani**, Hans Peter Nilles and Ivonne Zavala, *Axiology*, JCAP 1209 (2012) 006 [arXiv:1207.1128].
- Manuel Drees and **Encieh Erfani**, *Dark Matter Primordial Black Holes and Inflation Models*, arXiv: 1205.4012,

http://moriond.in2p3.fr/Proceedings/2012/Moriond_Cosmo_2012.pdf

- Manuel Drees and **Encieh Erfani**, *Running Spectral Index and Formation of Primordial Black Hole in Single Field Inflation Models*, JCAP 1201 (2012) 035 [arXiv: 1110.6052].
- Manuel Drees and **Encieh Erfani**, *Running–Mass Inflation Model and Primordial Black Holes*, JCAP 1104 (2011) 005 [arXiv:1102.2340].
- Alejandro Cabo, Matts Roos and **Encieh Erfani**, *Dilaton Stabilization by Massive Fermion Matter*, *Astrophys. Space Sci.* 340 (2012) 381-397 [arXiv:1011.4871].
- Alejandro Cabo, Matts Roos and **Encieh Erfani**, *On the Stability of the Dilaton Mean Field*, *Int. J. Mod. Phys. E20* (2011) 245-253.

Students

M.Sc. **Manizheh Sarijloo**, *Primordial Black Holes in the light of Gravitational Lensing*, Nov. 2020 – present.

Sara Motallebi, *Analysis of the Cosmic Microwave Background with Deep Learning*, Oct. 2018 – Dec. 2019.

Mohammad Savari, *Investigation on Primordial Black Holes from Gravitational Waves Perspective*, Oct. 2018 – Dec. 2019.

Teaching Experience

Lecturer, IASBS, Zanjan, Iran.

Dec. 2020 – Mar. 2021 Modern Quantum Mechanics I (virtual)

Oct. – Dec. 2020 Astronomy I (virtual)

Apr. – Jul. 2020 Quantum Physics IV (virtual)

Lecturer, 25th Physics School, IASBS, Zanjan, Iran.

1 – 6 Feb. 2020 Cosmic Origin of Elements

Lecturer, IASBS, Zanjan, Iran.

Oct. – Dec. 2019 Quantum Physics (International Students)

Apr. – Jul. 2019 Particle Physics

Lab of Modern Physics

Dec. 2018 – Mar. 2019 Astrophysics II

General Relativity

Oct. – Dec. 2018 Astrophysics I

Apr. – Jul. 2018 Quantum Physics III

Cosmology

Lecturer, PWF Workshop in High Energy Physics, Kabul Uni., Afghanistan.

Mar. 2018 Cosmology

Lecturer, IASBS, Zanjan, Iran.

Dec. 2017 – Mar. 2018 Quantum Physics II

Gravitation

Oct. – Dec. 2017 Quantum Physics I

Lab of Modern Physics

- Apr. – Jul. 2017 General Relativity
Modern Physics
- Dec. 2016 – Mar. 2017 Special Relativity
- Oct. – Dec. 2016 Cosmology
- Apr.– Jul. 2016 Group Theory
- Dec. 2015 – Mar. 2016 Particle Physics
Lecturer, *Latin-American School on High Energy Physics*, Havana, Cuba.
- 11 – 15 Jul. 2016 Particle Physics
Lecturer, *21st Physics School*, IASBS, Zanjan, Iran.
- 13 – 18 Feb. 2016 Particle Physics
Lecturer, *19th Physics School*, IASBS, Zanjan, Iran.
- 21 – 22 Feb. 2014 Cosmology
Tutor, *IPM*, Tehran, Iran.
- Feb. – Jun. 2013 Special Topics in the Early Universe History
- Oct. 2012 – Jan. 2013 Beyond the Standard Model of Elementary Particles
Lecturer, *18th Physics School*, IASBS, Zanjan, Iran.
- 20 Feb. 2013 Early Universe Cosmology
Tutor, *Physikalisches Institut der Universität Bonn*, Bonn, Germany.
- Oct. 2011 – Apr. 2012 Theoretical Particle Physics I
- Oct. 2009 – Apr. 2010 Advanced Quantum Mechanics
- Jan. – Apr. 2009 Theoretical Particle Physics II
Teaching Assistant, *Tabriz University*, Tabriz, Iran.
- Sep. 2006 – Feb. 2007 Electromagnetism, Classical Mechanics, Modern Physics, Fundamental Physics
- Aug. 2006 – Jun. 2007 **Head of the Astronomy Group**, *Azerbaijan Student Research Center*, Tabriz, Iran.
Lecturer, *Azerbaijan Student Research Center*, Tabriz, Iran.
- Dec. 2006 – Aug. 2007 Astronomy for high school students

Presentations

- 4 Nov. 2020 **PBHs; DM Candidate in the Framework of the SM of Cosmology (virtual)**, *Dark Matter Day*, Zharfa Group.
- 9 Sep. 2020 **Primordial Black Holes and their Formation (virtual)**, *IWARA 2020*, Mexico City, Mexico.
- 12 Apr. 2020 **Primordial Black Holes (Invited Talk)**, Sharif Uni., Tehran, Iran.
- 30 Dec. 2019 **Cosmic Origin of Elements**, *IYPT 2019*, IASBS, Zanjan, Iran.
- 11 Nov. 2019 **Transit of Inner Planets**, *Transit of Mercury Workshop*, IASBS, Zanjan, Iran.
- 18 Sep. 2019 **The Sky from the Perspective of a Cosmologist**, *Monthly Astronomy Club of the Astronomy Society of Iran for Public*, Tehran Uni., Tehran, Iran.
- 12 Sep. 2019 **Primordial Black Holes after Gravitational Waves**, *Precision Gravity: From the LHC to LISA*, MIAPP, Munich, Germany.
- 13 Feb. 2018 **PBHs from Particle Production During Inflation**, Gravity and Cosmology 2018, YITP, Kyoto, Japan.

- 7 Sep. 2017 **Primordial Black Holes and their Formation**, ICTP, Trieste, Italy.
- 21 Jul. 2017 **PBHs from Particle Production During Inflation**, Advances in Theoretical Cosmology in Light of Data, NORDITA, Stockholm, Sweden.
- 20 May 2017 **Dark Matter: Our Position? (Invited Talk)**, Isfahan University of Technology, Isfahan, Iran.
- 8 Feb. 2017 **Dark Matter: Where We Stand? (Invited Talk)**, Gravitation and Cosmology Conference, IASBS, Zanjan, Iran.
- 18 Dec. 2016 **Primordial Black Holes Formation by Particle Production during Inflation (Invited Talk)**, Sharif Uni., Tehran, Iran.
- 2 Nov. 2016 **Primordial Black Holes Formation by Particle Production during Inflation**, IPM, Tehran, Iran.
- 3 Sep. 2016 **Dark Matter Primordial Black Holes (Invited Talk)**, *4th Workshop and Seminar on Topics in Theoretical Physics*, Azerbaijan Shahid Madani Uni., Tabriz, Iran.
- 24 Aug. 2016 **Dark Matter Primordial Black Holes and their Formation**, Tokyo Institute of Technology, Tokyo, Japan.
- 10 Aug. 2016 **Primordial Black Holes and their Formation**, IPMU, Tokyo, Japan.
- 20 Jul. 2016 **Primordial Black Holes Formation by Particle Production during Inflation**, *Latin-American Conference on High Energy Physics*, Havana Uni., Havana, Cuba.
- 19 May 2016 **Primordial Black Holes Formation by Particle Production during Inflation (Invited Talk)**, *23rd IPM Physics Spring Conference*, IPM, Tehran, Iran.
- 13 May 2016 **Primordial Black Holes and their Formation**, *19th Meeting on Research in Astronomy*, IASBS, Zanjan, Iran.
- 23 Nov. 2015 **Primordial Black Holes as Dark Matter**, *Dark Matter day in São Paulo*, ICTP-SAIFR, São Paulo, Brazil.
- 27 Oct. 2015 **Primordial Black Holes and Inflation**, Observatório Nacional, Rio de Janeiro, Brazil.
- 16 Oct. 2015 **Inflation and Dark Matter Primordial Black Holes**, Cosmo-ufes, Vitória, Brazil.
- 22 Sep. 2015 **Dark Matter Primordial Black Holes and Inflation**, UNICAMP, Campinas, Brazil.
- 18 Jun. 2015 **Inflation and Dark Matter Primordial Black Holes**, ICTP-SAIFR, São Paulo, Brazil.
- 9 Jun. 2015 **Inflation and Dark Matter Primordial Black Holes**, IFUSP, São Paulo, Brazil.
- 26 Sep. 2014 **Inflation and Dark Matter Primordial Black Holes**, *Particle Cosmology after Planck*, DESY, Hamburg, Germany.
- 16 Sep. 2014 **Dark Matter Primordial Black Holes and Inflation**, *Cosmology after Planck*, MIAPP, Munich, Germany.
- 26 Jun. 2014 **Inflation and Dark Matter Primordial Black Holes**, PASCOS 2014, Warsaw, Poland.
- 27 Aug. 2013 **Dark Matter Primordial Black Holes**, *SUSY 2013*, ICTP, Trieste, Italy.
- 18 Sep. 2012 **Axiology**, *Particles and the Universe*, TR33-Summer Institute, Corfu, Greece.
- 7 Oct. 2011 **Dark Matter Primordial Black Holes and Inflation Models (Poster, selected for flash talk)**, *The Dark Universe Conference*, Heidelberg, Germany.

6 May 2011 **Running–mass Inflation Model and Primordial Black Holes**, *Kosmologietag*, Bielefeld, Germany.

Conferences & Workshops

- Feb. 8 – 12, 2021 **Primordial Black Holes confront GW data**, Online.
- Nov. 18 – 20, 2020 **BeyondPlanck Release Conference**, Online.
- Sep. 6 – 12, 2020 **9th International Workshop on Astronomy and Relativistic Astrophysics (Virtual)**, Mexico City, Mexico.
- Dec. 18, 2019 **National Conference of Iran Observatories**, *Kharazmi Uni.*, Tehran, Iran.
- Aug. 26 – Sep. 6, 2019 **Precision Gravity: From the LHC to LISA**, *MIAPP*, Munich, Germany.
- Apr. 8 – 12, 2019 **Advanced Workshop on Accelerating the Search for Dark Matter with Machine Learning**, *ICTP*, Trieste, Italy.
- May 3, 2019 **Girl Astronomers**, Tehran, Iran.
- Mar. 5 – 8, 2019 **International Conference on Contemporary Issues in Data Science (CiDaS)**, *IASBS*, Zanjan, Iran.
- Nov. 26 – 29, 2018 **TWAS 28th General Meeting (Invited)**, *ICTP*, Trieste, Italy.
- Sep. 26 – 29, 2018 **Cosmology on Small Scales**, *Institute of Mathematics*, Prague, Czech Republic.
- Jun. 30 – Jul. 5, 2018 **Data Science Summer School**, *IPM*, Tehran, Iran.
- Feb. 12 – 24, 2018 **Gravity and Cosmology 2018**, *YITP*, Kyoto, Japan.
- Nov. 7 – 11, 2017 **World Science Forum**, *Dead Sea*, Jordan.
- Nov. 6, 2017 **Tools for Cultural Dexterity to Prevent Weaponization of Sciences**, *World Science Forum*, Dead Sea, Jordan.
- Jul. 17 – 21, 2017 **Advances in Theoretical Cosmology in Light of Data**, *NORDITA*, Stockholm, Sweden.
- May 18, 2017 **The 2nd Gathering of Women in Physics of Iran**, *IUT*, Isfahan, Iran.
- Feb. 8 – 9, 2017 **Gravitation and Cosmology Conference**, *IASBS*, Zanjan, Iran.
- Sep. 1 – 3, 2016 **4th Workshop and Seminar on Topics in Theoretical Physics**, *Azerbaijan Shahid Madani Uni.*, Tabriz, Iran.
- Jul. 18 – 22, 2016 **Latin-American Conference on High Energy Physics**, *Havana Uni.*, Havana, Cuba.
- May 18 – 19, 2016 **23rd IPM Physics Spring Conference**, *IPM*, Tehran, Iran.
- May 12 – 13, 2016 **19th Meeting on Research in Astronomy**, *IASBS*, Zanjan, Iran.
- May 2 – 6, 2016 **Workshop on Perspectives on the Extragalactic Frontier**, *ICTP*, Trieste, Italy.
- 23 Nov. 2015 **Dark Matter day in São Paulo**, *ICTP-SAIFR*, São Paulo, Brazil.
- Aug. 17 – 28, 2015 **International Neutrino Summer School 2015**, *ICTP-SAIFR*, São Paulo, Brazil.
- Aug. 11 – 15, 2015 **Workshop on Astrophysics and Relativity: Astro-GR 2015**, *ICTP-SAIFR*, São Paulo, Brazil.
- Aug. 3 – 11, 2015 **School on Gravitational Waves: from data to theory and back**, *ICTP-SAIFR*, São Paulo, Brazil.

- Apr. 13 – 17, 2015 **Workshop on off-the-Beaten-Track of Dark Matter**, *ICTP*, Trieste, Italy.
- Jan. 25 – 28, 2015 **Galaxies Inside & Out**, *IPM*, Tehran, Iran.
- Sep. 23 – 26, 2014 **Particle Cosmology after Planck**, *DESY*, Hamburg, Germany.
- Sep. 4 – 19, 2014 **Cosmology after Planck**, *MIAPP*, Munich, Germany.
- Aug. 18 – 21, 2014 **Workshop on Cosmology from Baryons at High Redshift**, *ICTP*, Trieste, Italy.
- Jun. 22 – 26, 2014 **PASCOS 2014**, *Warsaw*, Poland.
- Aug. 26 – 31, 2013 **21st International Conference on Supersymmetry (SUSY2013)**, *ICTP*, Trieste, Italy.
- Jul. 22 – Aug. 2, 2013 **School and Workshop on New Light in Cosmology from the CMB**, *ICTP*, Trieste, Italy.
- Sep. 16 – 22, 2012 **Particles and the Universe**, *TR33-Summer Institute*, Corfu, Greece.
- Mar. 10 – 17, 2012 **Cosmology**, *47th Rencontres de Moriond*, La Thuile, Italy.
- Jun. 14 – 18, 2011 **Vth International Workshop on Particle Physics & Cosmology**, *CERN*, Geneva, Switzerland.

Research Visits

- 26 Aug. – 6 Sep. 2019 **MIAPP (Institute for Astro- and Particle Physics)**, Munich, Germany.
- 5 – 25 Aug., 2019 **ICTP (International Center for Theoretical Physics)**, Trieste, Italy.
- 23 Aug – 30 Sep., 2018 **ICTP (International Center for Theoretical Physics)**, Trieste, Italy.
- 14 Jul. – 11 Sep., 2017 **ICTP (International Center for Theoretical Physics)**, Trieste, Italy.
- 22 – 31 Aug., 2016 **Tokyo Institute of Technology (TiTech)**, Tokyo, Japan.
- 8 – 21 Aug., 2016 **Institute for Physics and Mathematics of the Universe (IPMU)**, Tokyo, Japan.
- 27 Oct. – 1 Nov., 2015 **Observatório Nacional**, Rio de Janeiro, Brazil.
- Oct. 14 – 16, 2015 **Cosmo-ufes**, Vitória, Brazil.
- 2 Jun. – 30 Nov. 2015 **ICTP South American Institute for Fundamental Research (ICTP-SAIFR)**, São Paulo, Brazil.
- 4 – 19 Sep. 2014 **MIAPP (Institute for Astro- and Particle Physics)**, Munich, Germany.
- 2 – 3 Sep. 2014 **Groningen University**, Groningen, Netherlands.
- 4 – 31 Aug. 2014 **ICTP (International Center for Theoretical Physics)**, Trieste, Italy.
- 22 Jul. – 31 Aug. 2013 **ICTP (International Center for Theoretical Physics)**, Trieste, Italy.
- Jan. 1 – 21, 2011 **IPM (Institute for Research in Fundamental Sciences)**, Tehran, Iran.
- 15 Oct. – 10 Dec. 2010 **KIAS (Korea Institute for Advanced Study)**, Seoul, Korea.

Languages

English fluent
 French good
 Spanish basic

German basic
 Persian native
 Azeri native

Computer Skills

L^AT_EX, Mathematica, Python, IDL, IRAF

References

Prof. Manuel Drees

Physikalisches Institut der Universität
Bonn
Nussallee 12, D-53115 Bonn, Germany
drees@th.physik.uni-bonn.de

Prof. Paolo Creminelli

ICTP (International Center for Theoretical
Physics)
Strada Costiera 11, I-34151 Trieste, Italy
creminel@ictp.it

Prof. Mohammad Reza Kolahchi

IASBS (Institute for Advanced Studies in
Basic Sciences)
P. Code 45137-66731, Zanjan, Iran
kolahchi@iasbs.ac.ir

Prof. Yousef Sobouti

IASBS (Institute for Advanced Studies in
Basic Sciences)
P. Code 45137-66731, Zanjan, Iran
sobouti@iasbs.ac.ir

Prof. Shant Baghran

Sharif University of Technology
P. Code 11155-9161, Tehran, Iran
baghran@sharif.edu

Prof. Hamid Reza Sepangi

Shahid Beheshti University
P. Code 19839-63113, Evin, Tehran, Iran
hr-sepangi@sbu.ac.ir