

Zohreh Ravanpak

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SPMS, Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798



Research area : Differential Geometry and Mathematical Physics

EDUCATION

- 2018 **PhD, Mathematics, Geometry.** Azarbaijan Shahid Madani University, Tabriz, Iran, with Ghorbanali Haghi-ghatdoost and Adel Rezaei Aghdam. Dissertation title : Poisson-Nijenhuis Lie structures, Hamiltonian and bi-Hamiltonian integrable systems on low dimensional Lie groups.
- 2017 **PhD Internship.** Warsaw Center of Mathematics and Computer Science (WCMCS), Warsaw, Poland, with Janusz Grabowski. **6 months**
- 2015- 2016 **PhD sabbatical leave.** La Laguna University, Tenerife, Spain, with Juan Carlos Marrero. **7 months**
- 2007 **MSc, Geometry,** Mahani Mathematical Research Center, Iran, with Yousef Bahrampour.
- 2003 **BSc, Applied Mathematics.** Azad University, Kerman, Iran.

GRANTS, AND SELECTION-BASED ACHIEVEMENTS

- Sep 2023-Aug 2027 Spanish Ministry of Science and Innovation under grants PID2022-137909NB-C22, **Spain**, Role : Researcher, Principal Investigator : Juan Carlos Marrero.
- Feb 2017-Aug 2017 Ph.D. Internship : Warsaw Center of Mathematics and Computer Science (WCMCS), **Poland**.
- Nov 2015-Jun 2016 Ministry of Science, Research and Technology (MSRT) of **Iran**, grant 2015-21540.

RESEARCH EXPERIENCES

- 2025-2026 **Research Fellow | School of Physical and Mathematical Sciences, NANYANG TECHNOLOGICAL UNIVERSITY, Singapore**
 - > Since October 2025
- 2025 **Visiting Scientist | Max-Planck Institute, BONN, Germany**
 - > July 2025-September 2025
- 2023-2025 **Postdoctoral researcher | West University of Timisoara, TIMISOARA, Romania**
 - > May 2023-May 2025
- 2022-2023 **Postdoctoral researcher | Max-Planck Institute, BONN, Germany**
 - > October 2022-April 2023
- 2019-2022 **Postdoctoral researcher | Institute of Mathematics of the Polish Academy of Sciences, WARSAW, Poland**
 - > October 2019-October 2022

TEACHING EXPERIENCES

- Spring 2017 **Teaching Assistant | University of Warsaw , WARSAW, Poland**
 - > Faculty of Economic Sciences
 - Mathematical Analysis II
- Fall 2016 **Lecturer | Azarbaijan Shahid Madani University, TABRIZ, Iran**
 - > Department of Mathematics
 - Differential Geometry

2010-2012 | Lecturer | Shahid Bahonar University , KERMAN, Iran

> Department of Mathematics and Engineering

Calculus I Calculus II Differential equations

2007-2012 | Lecturer | Azad University , KERMAN, Iran

> Department of Mathematics, Physics, Engineering, and Management

Calculus I Calculus II Differential Equations Numerical calculations Applied Mathematics
Mathematics and Application in Management Basic Math course for Accountancy Basic Math course for Chemistry
Basic Math course for Computer Basic Math course for Technical and Engineering

PREPRINTS

METRIC DEGENERACIES AND GRADIENT FLOWS ON SYMPLECTIC LEAVES

2025

 arXiv

Zohreh Ravanpak Cornelia Vizman

JOURNAL PUBLICATIONS

GENERALIZED DOUBLE BRACKET VECTOR FIELDS

2025

Mathematical Physics, Analysis and Geometry, Vol **28**, Article 30, 2025.

 DOI  arXiv

Petre Birtea Zohreh Ravanpak Cornelia Vizman

NL BIALGEBRAS

2024

Advances in Theoretical and Mathematical Physics, Vol. **29**, Issue 5, 2025, pp. 1407-1445.

 DOI  arXiv

Zohreh Ravanpak

UNIMODULARITY AND INVARIANT VOLUME FORMS FOR HAMILTONIAN DYNAMICS ON POISSON-LIE GROUPS

2023

J. Phys. A : Math. Theor. **56** 015203

 DOI  arXiv

Ivan Gutierrez-Sagredo David Iglesias Ponte Juan Carlos Marrero Edith Padrón Zohreh Ravanpak

VB-STRUCTURES AND GENERALIZATIONS

2022

Annals of Global Analysis and Geometry, **62** : 235–284

 DOI  arXiv

Katarzyna Grabowska Janusz Grabowski Zohreh Ravanpak

NONASSOCIATIVE ANALOGS OF LIE GROUPOIDS

2022

Differential Geometry and its Applications, Volume **82**, 101887, ISSN 0926-2245

 DOI  arXiv

Janusz Grabowski Zohreh Ravanpak

TRANSITIVE LIE ALGEBRAS OF NILPOTENT VECTOR FIELDS AND THEIR TANAKA PROLONGATIONS

2021

Journal of Lie Theory **31** No. 4, 1003-1014

 DOI  arXiv

Katarzyna Grabowska Janusz Grabowski Zohreh Ravanpak

DISCRETE MECHANICS ON UNITARY OCTONIONS

2021

Int J. Geom. Methods Mod. Phys. Vol. **18**, No. 06, 2150093

 DOI  arXiv

Janusz Grabowski Zohreh Ravanpak

SOME REMARKS ON INVARIANT POISSON QUASI-NIJENHUIS STRUCTURES ON LIE GROUPS

2019

Int. J. Geom. Methods Mod. Phys. Vol. **16**, 1950097

 DOI  arXiv

Ghorbanali Haghighatdoost Adel Rezaei-Aghdam Zohreh Ravanpak

INVARIANT POISSON NIJENHUIS STRUCTURES ON LIE GROUPS AND CLASSIFICATION

2018

Int. J. Geom. Methods Mod. Phys. Vol. **15**, 1850059

 DOI  arXiv

Zohreh Ravanpak Adel Rezaei-Aghdam Ghorbanali Haghighatdoost

INVITED EVENTS OR RESEARCH STAYS

24-27 Sep 2025	West University of Timisoara, Romania.
06-24 Sep 2025	Facultades de Física y Matemáticas, Universitat de La Laguna, Tenerife, Spain.
02-08 Feb 2025	Erwin Schrödinger International Institute for Mathematics and Physics, Vienna, Austria.
14 Oct-14 Dec 2024	Erwin Schrödinger International Institute for Mathematics and Physics, Vienna, Austria.
17-29 Sep 2024	Department of Mathematics, Jilin University, Changchun, China.
17-28 Jul 2023	Galileo Galilei Institute for Theoretical Physics, Arcetri, Florence, Italy.
16-26 Aug 2022	Erwin Schrödinger International Institute for Mathematics and Physics, Vienna, Austria.
05-19 Jun 2022	Facultades de Física y Matemáticas, Universitat de La Laguna, Tenerife, Spain.
08-15 May 2022	Institut de Mathématiques de Toulouse, Université Paul Sabatier, Toulouse III, France.

SEMINAR TALKS : INVITED TALKS (*)

* 05 Sep 2025	CUNEF Universidad, Madrid, Spain. "Poisson Geometry and Bi-Hamiltonian Systems : From Manifolds to Lie Groups".
03 Sep 2025	Università degli studi di Bergamo, Italy. "New Algebraic framework for Lie-Poisson Bi-Hamiltonian Systems".
06 Aug 2025	MPIM, Bonn, Germany, Higher Differential Geometry Seminar : "Analogues of Poisson-Nijenhuis Structures : From Manifolds to Lie Bialgebras".
* 28 Jul 2025	European Non-Associative Algebra Seminar : Virtual "NL bialgebras".
* 22 Jul 2025	University of Cologne, Germany, Poisson Geometry Seminar : "Analogues of Poisson-Nijenhuis Structures : From Manifolds to Lie Bialgebras".
* 14 Nov 2024	FAU Erlangen-Nürnberg, Erlangen, Germany : "Poisson bi-Hamiltonian systems on Lie groups : Algebra, Geometry and Dynamics".
* 26 Sep 2024	Department of Mathematics, Jilin University, Changchun, China : "NL bialgebras".
* 05 Dec 2023	Claude Bernard Lyon 1 University : "Nonassociative generalization of Lie groupoids".
* 28 Nov 2023	University of Geneva : "Nonassociative generalization of Lie groupoids and discrete mechanics".
* 03 May 2023	West University of Timisoara : "Poisson bi-Hamiltonian systems on Lie groups : Geometry and Dynamics".
23 Nov 2022	MPIM, Bonn, Germany, Higher Differential Geometry Seminar "Unimodularity and invariant volume forms for Hamiltonian dynamics on Poisson-Lie groups".
11 Feb 2022	Graduate Inter-university Math Seminars : "Discrete mechanics on non-associative objects".
* 25 Oct 2021	University of Würzburg, Oberseminar Geometrie : "Discrete mechanics on non-associative objects".
* 25 Mar 2021	University of Warsaw, Seminarium KMMF : "How to construct discrete mechanics on octonions?"
* 16 Dec 2020	IMPAN, Warsaw, Differential Equations and Geometry Seminar : "Discrete mechanics on octonions".
* 21 Oct 2020	University of Warsaw, Geometrical methods in physics : "Discrete mechanics on non-associative objects".
* 27 Nov 2019	University of Warsaw, Geometrical methods in physics : "Brief introduction to Poisson geometry"
09 Oct 2019	IMPAN, Warsaw, Differential Equations and Geometry Seminar : "Bi-Hamiltonian systems on Poisson-Lie groups and underlying geometric structures".
8 Mar 2017	IMPAN, Warsaw, Geometrical methods in physics : "Study on the Lie group and Lie groupoid approach to Poisson-Nijenhuis structures".
06 Oct 2016	University of Azarbaijan Shahid Madani, Tabriz : "Bi-Hamiltonian Systems and Integrable Deformations".
17 Dec 2015	University of La Laguna, Tenerife : "Classification of Poisson-Nijenhuis structures on low dimensional Lie groups".
20 May 2015	University of Tabriz, Iran : "Poisson-Nijenhuis structures on Lie groups".

CONFERENCES, WORKSHOPS AND SCHOOLS - PARTICIPATION AND PRESENTATIONS

20-22 Sep 2024	International Industry-University-Research Application 5th Regional Algebra Symposium , Jilin University, Changchun, China.
20-25 Jun 2024	XVI International ICMAT Summer School on Geometry, Dynamics and Field theory , Miraflores de la Sierra, Madrid : "Generalized double bracket vector fields".
07-12 Jan 2024	Winter School in Mathematical Physics 2024 SwissMAP Research Station, Les Diablerets, Switzerland.
31 Oct-03 Nov 2023	Atelier on higher structures in differential geometry Institut Camille Jordan, Université Claude-Bernard Lyon 1 : "Smooth loopoids".

- 17-28 Jul 2023 [!\[\]\(effbd7993c63c039a58fd3395789cf3f_img.jpg\) Emergent Geometries from Strings and Quantum Fields](#) Galileo Galilei Institute for Theoretical Physics, Arcetri, Florence.
- 03-07 Jul 2023 [!\[\]\(144980d038f2541d7b588a8a9132bd70_img.jpg\) Dg-manifolds in Geometry and Physics](#) Institut Henri Poincaré, Paris.
- 19-23 Jun 2023 [!\[\]\(c4ce2d477989700c971cf3d240ad9283_img.jpg\) The many interactions of symplectic and Poisson geometry](#) A conference in honour of Alan Weinstein's 80th birthday, Institut Henri Poincaré, Paris : "Poisson and Nijenhuis Structures on Lie Groups and integrable systems"
- 17-21 Apr 2023 [!\[\]\(5013555a72072875cb154b597e002a46_img.jpg\) Higher Structures in Geometry and Mathematical Physics](#) CIRM-IHP PROGRAM, Luminy, France.
- 20-24 Mar 2023 [!\[\]\(bf2038c114ec21ea58ad011774351c98_img.jpg\) Interactions between Poisson Geometry and Quantisation](#) University of Göttingen, Germany : "Geometry and dynamics of bi-Hamiltonian systems on Poisson-Lie groups and integrable deformations".
- 16-26 Aug 2022 [!\[\]\(1ad0c3425edfa4762c2f20e33e3e5bbf_img.jpg\) Thematic Programme : Higher Structures and Field Theory](#) Erwin Schrödinger International Institute for Mathematics and Physics (ESI) -University of Vienna, Austria : "Unimodularity and invariant volume forms on Poisson-Lie groups".
- 17-23 Jul 2022 [!\[\]\(74d2fc5645add84f8511beb934060048_img.jpg\) Differential Geometry and its Applications](#) Hradec Králové, Czech Republic : "Discrete mechanics on non-associative objects".
- 10-14 Jan 2022 [!\[\]\(ddc5533caa0187e636e3d3234e0983a3_img.jpg\) Lie theory and Poisson geometry](#) CIRM, Luminy, France.
- 28 Jun-02 Jul 2021 [!\[\]\(7c207f8f59385c6dd11f9d9bdc7a0d1d_img.jpg\) XXXIX Workshop on Geometric Methods in Physics](#) Białowieża, Poland : "Discrete mechanics on octonions".
- 18-20 Sep 2019 **6th workshop and Seminar on Topics in Theoretical Physics (TTP6)**, Tabriz, Iran.
- 26-30 Jun 2017 **11th International Summer School on Geometry, Mechanics, and Control**, ICMATH, Madrid : "Lie group approach to Poisson-Nijenhuis structures".
- 06-10 Jun 2017 **The XXV International Conference on Integrable Systems and Quantum Symmetries (ISQS-25)**, Prague, Czech Republic.
- 11-12 Dec 2016 **Conference on Dynamical Systems and Geometric Theories**, Kerman, Iran : "A method of integrable deformations for bi-Hamiltonian systems".
- 20-24 Jun 2016 **10th ICMAT International Summer School on Geometry, Mechanics, and Control**, Miraflores de la Sierra, Madrid : "Bi-Hamiltonian systems and compatible multiplicative Poisson structures".
- 13-15 Jan 2016 **10th International Young Researcher Workshop on Geometry, Mechanics, and Control**, IHP, Paris, France.
- 29-30 Jan 2014 **The 7th seminar on Geometry and Topology**, Tehran, Iran.