

EIRIK EIK SVANES

University of Stavanger
Kristine Bonnevis vei 22, 4021 Stavanger, Norway
0047 98058593 ◊ eirik.e.svanes@uis.no ◊ eesvanes@gmail.com

EMPLOYMENT AND WORK EXPERIENCE

Associate Professor: *December 2019 - present*
University of Stavanger

Postdoctoral Fellow: *Simons Collaboration on Special Holonomy* *September 2017 - December 2019*
King's College London and ICTP Trieste

Postdoctoral Fellow: *Lagrange Fellow* *October 2014 - September 2017*
Institute Lagrange Paris
Laboratoire de Physique Théorique et Hautes Energies

Summer Intern *Summer 2009*
SINTEF Trondheim
Project: *Numerical simulations of 2d and 3d fluid dynamical systems*

Summer Intern *Summer 2008*
CERN Geneva
Project: *Simulations of ATLAS 3d silicon detector*

EDUCATION

University of Oxford *October 2010 - September 2014*
DPhil (Phd) in Theoretical & Mathematical Physics

Norwegian University of Science and Technology *August 2005 - June 2010*
Civil Engineering Degree and M.Sc. in Physics & Mathematics

University of California at Berkeley *Spring 2009*
Exchange Student

CERN Summer School *Summer 2008*
Summer Student

TEACHING AND SUPERVISION EXPERIENCE

PhD Supervision Experience
Supervisor: Javier Murgas (from Fall 2021)
Co-supervisor: Vegard Undheim (from Fall 2022), Informal co-supervisor for PhD student Marwan Najjar (2017-2019).

Master Student Supervision Experience
Master Students: Tomasz Kamil Szabluk (2023-2024), Alexander Serigstad (Spring 2023), Beatrice Chisamanga (2022-2023), Sander Winje (2021-2022), Silje Kristin Larsen (Spring 2021).

University of Stavanger *Spring 2020 - Present*
Lecturer for Forkurs: Mathematics: Fall 2020, Fall 2024
Lecturer for Abstract Algebra: Spring 2020, Spring 2021, Spring 2022, Spring 2023
Lecturer Linear Algebra: Fall 2021, Fall 2022, Fall 2023

ICTP Trieste *Fall 2017 - Spring 2019*
Lecturer for the Physics Without Frontiers Program: Master Course on QFT at Birzeit University, Spring 2019.

PUBLICATIONS

I list my publications according to date of publication. Note also that in my field of Mathematical and Theoretical Physics, authors are listed alphabetically on papers.

Journal Papers: Refereed

A. Ashmore, J. J. M. Ibarra, D. D. McNutt, C. Strickland-Constable, E. E. Svanes, S. Winje, D. Tennyson, A heterotic Kodaira-Spencer theory at one-loop, JHEP 10 (2023) 130, (arXiv:2306.10106)

P. M. Flydal, G. Quick, E. E. Svanes, A Note on Real Line Bundles with Connection and Real Smooth Deligne Cohomology, Acta Mathematica Vietnamica (2024), (arXiv:2303.05255)

J. McOrist, E. E. Svanes, Heterotic quantum cohomology, JHEP 11 (2022) 096, (arXiv:2110.06549)

B. S. Acharya, N. Lambert, M. Najjar, E. E. Svanes, J. Tian, Gauging discrete symmetries of T_N -theories in five dimensions, JHEP 04 (2022) 114, (arXiv:2110.14441)

A. Ashmore, A. Coimbra, C. Strickland-Constable, E. E. Svanes, D. Tennyson, Topological G_2 and $Spin(7)$ strings at 1-loop from double complexes, JHEP 02 (2022) 089, (arXiv:2108.09310)

B. S. Acharya, L. Foscolo, M. Najjar, E. E. Svanes, New G_2 -Conifolds in M-theory and their Field Theory Interpretation, JHEP 05 (2021) 250, (arXiv:2011.06998)

B. S. Acharya, A. Kinsella, E. E. Svanes, T3-invariant Heterotic Hull-Strominger Solutions, JHEP 01 (2021) 197, (arXiv:2010.07438)

X. de la Ossa, M. Larfors, M. Magill, E. E. Svanes, Superpotential of Three Dimensional $N = 1$ Heterotic Supergravity, JHEP 01 (2020) 195, (arXiv:1904.01027)

B. S. Acharya, A. P. Braun, E. E. Svanes, Roberto Valandro, Counting Associatives in Compact G_2 Orbifolds, JHEP 1903 (2019) 138 (arXiv:1812.04008)

A. Ashmore, X. de la Ossa, R. Minasian, C. Strickland-Constable, E. E. Svanes, Finite deformations from a heterotic superpotential: holomorphic Chern-Simons and an L_∞ algebra, JHEP 1810 (2018) 179 (arXiv:1806.08367)

M.-A. Fiset, C. Quigley, E. E. Svanes, Marginal deformations of heterotic G_2 sigma models, JHEP 1802 (2018) 052 (arXiv:1710.06865)

N. Halmagyi, D. Israel, M. Sarkis, E. E. Svanes, Heterotic Hyper-Kahler Flux Backgrounds, JHEP 1708, 138 (arXiv:1706.01725)

X. de la Ossa, M. Larfors and E. E. Svanes, The infinitesimal moduli space of heterotic G_2 systems, Communications of Mathematical Physics, 2017, pages 1-49 (arXiv:1704.08717)

C. de Lacroix, H. Erbin, E. E. Svanes, Minisuperspace computation of the Mabuchi spectrum, Classical and Quantum Gravity 2018, (arXiv:1704.05855)

R. Minasian, M. Petrini, E. E. Svanes, On Heterotic Vacua with Fermionic Expectation Values, Fortschritte der Physik 65 (arXiv:1702.01156)

X. de la Ossa, M. Larfors and E. E. Svanes, Infinitesimal moduli of G_2 holonomy manifolds with instanton bundles, JHEP 1611, 016 (arXiv:1607.03473)

N. Halmagyi, D. Israel, E. E. Svanes, The Abelian Heterotic Conifold, JHEP 1607, 029 (arXiv:1601.07561)

S. Angus, C. Matti, E. E. Svanes, $Spin(7)$ Compactifications and 1/4-BPS Vacua in Heterotic Supergravity, JHEP 1603 177 (arXiv:1512.02812)

C. de Lacroix, H. Erbin, E. E. Svanes, Mabuchi spectrum from the minisuperspace, Phys.Lett. B758 (2016) 186-189 (arXiv:1511.06150)

X. de la Ossa, E. Hardy and E. E. Svanes, The Heterotic Superpotential and Moduli, JHEP 1601, 049 (arXiv:1509.08724)

S. Grozdanov, D. Kraljic, E. E. Svanes, Inflationary Potentials from the Exact Renormalisation Group, Nucl.Phys. B909 (2016) 657-676 (arXiv:1508.01484)

A. Lukas, Z. Lalak and E. E. Svanes, Heterotic Moduli Stabilisation and Non-Supersymmetric Vacua, JHEP 1508, 020 (arXiv:1504.06978)

X. de la Ossa, M. Larfors and E. E. Svanes, Exploring $SU(3)$ Structure Moduli Spaces with Integrable G_2 Structures, *Advances in Theoretical and Mathematical Physics*, Volume 19, Number 4, pages 837-903 (arXiv:1409.7539)

X. de la Ossa and E. E. Svanes, Connections, Field Redefinitions and Heterotic Supergravity, *JHEP* 1412, 008 (arXiv:1409.3347)

X. de la Ossa and E. E. Svanes, Holomorphic Bundles and the Moduli Space of $N=1$ Supersymmetric Heterotic Compactifications, *JHEP* 1410, 123 (arXiv:1402.1725)

M. Klaput, A. Lukas and E. E. Svanes, Heterotic Calabi-Yau Compactifications with Flux, *JHEP* 1309, 034 (arXiv:1305.0594)

M. Klaput, A. Lukas, C. Matti and E. E. Svanes, Moduli Stabilising in Heterotic Nearly Kähler Compactifications, *JHEP* 1301, 015 (arXiv:1210.5933)

J. O. Anderson and E. E. Svanes, Functional renormalization group at finite density and Bose condensation, *Nuclear Physics A*, Volume 857, Issue 1, 1 May 2011, pages 16-28 (arXiv:1009.0430)

Conference Papers: Refereed

X. de la Ossa, M. Larfors and E. E. Svanes, Restrictions of Heterotic G_2 Structures and Instanton Connections, *Proceedings for Nigel Hitchin's 70th Birthday Conference* (arXiv:1709.06974)

X. de la Ossa, E. Hardy and E. E. Svanes, The Massless Spectrum of Heterotic Compactifications, *Proceedings of "The String Theory Universe" Workshop in Leuven, 7-11 Sept 2015* (arXiv:1511.02812)

TALKS, LECTURES AND SEMINARS

Invited Plenary Talks and Lectures

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| N-PACT Meeting , NTNU Alesund
<i>Swampland and the Distance Conjecture</i> | June 2024 |
| Simons Collaboration Workshop , Duke University
<i>Heterotic distance conjectures and symplectic cohomology</i> | May 2024 |
| New Deformations of Quantum Field and Gravity Theories , MATRIX Institute Australia
<i>Progress on Heterotic (Quantum) Moduli</i> | January 2024 |
| One-Day Geometry Workshop , University of Tromsø
<i>A Heterotic Kodaira-Spencer Theory at One-Loop</i> | October 2023 |
| Gauge Theory, Canonical Metrics and Geometric Structures , ICMAT Madrid
<i>A Heterotic Kodaira-Spencer Theory at One-Loop</i> | June 2023 |
| Geometric Structures and Supersymmetry , University of Tromsø
<i>Partition Functions of Heterotic Potentials</i> | August 2022 |
| MATRIX workshop on 2D Supersymmetric Theories and Related Topics , Online workshop
<i>Heterotic Moduli without Field Redefinitions</i> | January 2022 |
| 30th Nordic Network Meeting on Strings, Fields, and Branes , Nordita, Stockholm
<i>Moduli and topological field theories: A heterotic case study</i> | November 2021 |
| Geometric Structures and Supersymmetry , University of Tromsø
<i>Heterotic Moduli without Field Redefinitions</i> | August 2021 |
| Meeting on String Theory, Geometry and String Model Building , MITP Mainz
<i>Counting Associatives in G_2 manifolds and Non-Perturbative Superpotentials</i> | September 2018 |
| Workshop on Special Holonomy: Progress and Open Problems 2018 , SCGP Stony Brook
<i>String Dualities and an Infinity of Associative Submanifolds</i> | September 2018 |
| Workshop on Gauge Theory and Special Holonomy , Imperial College London
<i>On marginal deformations of heterotic G_2 geometries</i> | January 2018 |
| Simons Collaboration on Special Holonomy Annual Meeting , Simons Foundation, New York
<i>On the Coupled Moduli Space of Special Structure Manifolds with Instanton Bundles</i> | September 2017 |

Yorkshire and Durham Geometry Day , School of Mathematics, University of Leeds <i>On Moduli of Instantons on Special Structure Manifolds and Heterotic Solutions</i>	May 2017
Meeting on Geometry, Gravity and Supersymmetry , Mainz Institute for Theoretical Physics <i>New Developments in Heterotic Moduli</i>	April 2017
Workshop on (0,2)-Models , IHP Paris <i>The Massless Spectrum of Heterotic Compactifications</i>	June 2016
The String Theory Universe Conference , The University of Bern <i>Heterotic Supergravity, SU(3)-structures, and the α'-Expansion</i>	September 2013

Other Recent Conference Presentations

The String Phenomenology Conference , University of Liverpool <i>A Heterotic Kodaira-Spencer Theory at One-Loop</i>	July 2022
The String Phenomenology Conference , CERN <i>Local Heterotic Reductions</i>	June 2019
The String Phenomenology Conference , University of Warsaw <i>Special Lagrangians, Associatives and Non-Perturbative Superpotentials</i>	July 2018
The String Phenomenology Conference , Virginia Tech, Blacksburg Virginia <i>Moduli of Heterotic Backgrounds and their Effective Theories</i>	July 2017
The String Theory Universe Conference , KU Leuven <i>Moduli and the Heterotic Superpotential</i>	September 2015
The String Phenomenology Conference , IFT Madrid <i>Moduli and the Heterotic Superpotential</i>	June 2015

Recent Invited Talks and Seminars

String Theory Seminar , MITP Mainz, <i>Heterotic Quantum Moduli</i>	June 2023
Mathematical Physics Seminar Series , ICTP Trieste, <i>Heterotic Quantum Moduli</i>	March 2022
Exceptional Geometry Seminar Series , Online Seminar Series, <i>Heterotic Moduli without Field Redefinitions</i>	May 2021
Mathematical Physics Seminar , Harvard Mathematics Department, Harvard University, <i>Coupled Moduli Problems, and Effective Topological Theories</i>	September 2019
String Lunch Meeting , Kavli Institute for the Physics and Mathematics of the Universe, Tokyo <i>Counting Associatives in G2 manifolds and Non-Perturbative Superpotentials</i>	December 2018
Mathematics and String Seminar , Kavli Institute for the Physics and Mathematics of the Universe, Tokyo <i>Moduli, Holomorphic Algebroids and Effective Actions</i>	November 2018
Mathematics Seminar , Department of Theoretical Physics and Mathematics, University of Stavanger <i>Holomorphic Algebroids and Deformation Theory</i>	August 2018
Geometry Seminar , School of Mathematics, Leeds University <i>Algebroids and Deformations</i>	July 2018
Theoretical Physics Seminar , Simons Center for Geometry and Physics, Stony Brook <i>Heterotic Moduli and Effective Theories</i>	April 2018

SCIENTIFIC TRAVELS AND VISITS

ICTP, Trieste Scientific Visitor and Postdoc working with Professor Bobby Acharya	September 2017 - December 2019
Kavli IPMU, Tokyo Scientific Visitor of Doctor Marco Bertolini	November 2018 - December 2018

Simons Center for Geometry and Physics, Stony Brook
Scientific Visitor of Michele del Zotto

April 2018

CERN, Geneva
Short-Term Visitor to CERN Theory Group

July 2016 - August 2016

Perimeter Institute, Waterloo Canada
Scientific Visitor of Professor Xenia de la Ossa

March 2012

FELLOWSHIPS AND RESEARCH GRANTS

External partner of EPSRC grant *Awarded March 2023*
Three year research grant awarded to Charles Strickland-Constable at the University of Hertfordshire.

Yngre Fremragende Forskere Awarded by the University of Stavanger *Awarded February 2022*
A one-year travel grant.

Humboldt Fellow Awarded by the the Alexander von Humboldt Foundation *Awarded July 2017*
Postdoctoral research grant to be held at German institution of my choosing,
Declined
Declined due to prior commitment with the Simons Collaboration.

CERN Short-Term Visitor Grant *Awarded May 2016*
Three weeks travel and visitor grant awarded by the CERN theory group. *Period: July 2016 - August 2016*

Lagrange Fellow *Awarded January 2014*
Three year postdoctoral fellowship awarded by Institute Lagrange Paris. *Period: October 2014 - October 2017*

AWARDS AND SCHOLARSHIPS

Clarendon Scholar *Awarded April 2010*
Full Scholarship awarded by Oxford University and OUP

Dervorguilla Scholar *Awarded April 2010*
Scholarship awarded by Balliol College, Oxford University.

Best Student in a Civil Engineering or Civil Architecture Program *Awarded September 2011*
Norwegian University of Science and Technology, Class Graduating 2010.

Best Master Thesis *Awarded June 2010*
Norwegian University of Science and Technology, Faculty of Science and Technology

OTHER HONORS

Honour for best TA *Awarded August 2018*
Elected best TA for the year of 2017/2018 by the high energy physics masters students at ICTP Trieste.

REVIEW ASSIGNMENTS

Communications in Mathematical Physics *from 2023*

Journal of High Energy Physics *from 2020*

Crelle's Journal for Pure and Applied Mathematics *from 2018*

The European Physical Journal *from 2018*

zbMATH (Zentralblatt MATH) *from 2017*

SIGMA: Symmetry, Integrability and Geometry - Methods and Applications *from 2016*

Mathematical Reviews, American Mathematical Society *from 2014*

ORGANISATION DUTIES

Organiser of workshop: Nordic String Meeting University of Stavanger	<i>December 2023</i>
Organiser of Geometry Seminar University of Stavanger	<i>From Fall 2022</i>
Organiser of Geometry Reading Group University of Stavanger	<i>2022-2023</i>
Organiser of workshop: String Geometry in Stavanger University of Stavanger	<i>August 2022</i>
Co-Organiser of String Theory Seminar Laboratoire de Physique Théorique et Hautes Energies and École Normale Supérieure, Paris	<i>Spring 2017</i>
Co-Organiser of String Theory Journal Club Laboratoire de Physique Théorique et Hautes Energies and École Normale Supérieure, Paris	<i>October 2014 - September 2017</i>

OUTREACH AND DISSEMINATION ACTIVITIES

Two-Day meeting with Physics Olympiad Students University of Oslo	<i>July 2024</i>
Seminar on Symmetries in Physics St. Olav VGS.	<i>April 2024</i>
Seminar on High Energy Physics Molde VGS.	<i>April 2024</i>
Seminar on Symmetries in Physics Dalane VGS.	<i>February 2023</i>
Seminar on High Energy Physics Teachers open day at Bryne VGS.	<i>February 2023</i>
Online seminar on differential equations with applications Rauma VGS.	<i>March 2022</i>
Online seminar on differential equations with applications Drottningsborg VGS.	<i>March 2022</i>
Online seminar on differential equations with applications Molde VGS.	<i>March 2021</i>
Discussion on String Theory with Aleksi Kurkela University of Stavanger.	<i>March 2021</i>
Lecturer for “Physics Without Frontiers” program ICTP Trieste and King’s College London.	<i>Spring 2018</i>
Lecture on String Theory for Romanian artists as part of the Art and Science Residence ICTP Trieste	<i>October 2018</i>
Lecture on String Theory for High School Students from Sandvika VGS Institut Astrophysique de Paris	<i>March 2017</i>