

LARA B. ANDERSON

Department of Physics (MC 0435)
Virginia Tech
850 Campus Drive
Blacksburg, VA, 24061, USA.

Tel: (+1) 215 510 0693
Fax: (+1) 540 231 7511
email: lara.anderson@vt.edu
URL: <http://www.phys.vt.edu/lara137/>

Employment

- 2019 - **Associate Professor of Physics and Affiliate Professor of Mathematics**
Virginia Tech (Blacksburg, VA, USA),
- 2013 - 2019 **Assistant Professor of Physics and Affiliate Professor of Mathematics**
Virginia Tech (Blacksburg, VA, USA),
- 2011-2013 **Postdoctoral Researcher in Theoretical Physics**
Harvard University (Boston, MA, USA),
- 2008-2011 **Postdoctoral Researcher in Theoretical Physics**
University of Pennsylvania (Philadelphia, PA, USA),
- 2008-2009 **Visiting Researcher in Theoretical/Mathematical Physics**
Institute for Advanced Study (Princeton, NJ, USA),
- 2006-2008 **Stipendiary Lecturer in Applied Mathematics**
Pembroke College, University of Oxford (Oxford, UK)
- 2006 **Stipendiary Lecturer in Applied Mathematics**
Somerville College, University of Oxford (Oxford, UK)

VISITING POSITIONS/FELLOWSHIPS

Kavli Institute for Theoretical Physics, UC Santa Barbara (2010). Isaac Newton Institute for Mathematical Sciences, University of Cambridge (2012). Simons Center for Geometry and Physics (2012). Simons Center for Geometry and Physics (2019). Mathematical Sciences Research Institute, UC Berkeley (2022). Perimeter Institute (*Emmy Noether Fellow*) (2023). Kavli Institute for Theoretical Physics, UC Santa Barbara (2024).

Research Interests:

Physics – String Theory (including M-theory, F-theory, and Heterotic string theory), String Phenomenology, High Energy Particle Physics, Gauge Theory, Supersymmetry
Mathematics – Algebraic Geometry and Topology (including computational algebraic geometry), Geometric Invariants, Moduli Spaces, Special Holonomy/Special Structure Manifolds.

Education

- 2004-2008 **University of Oxford (Oxford, UK),**
PhD in Mathematical Physics.
Thesis Advisors: Philip Candelas (Mathematics) and Andre Lukas (Theoretical Physics)
- 2003-2004 **Utah State University (Logan, UT, USA),**
Master of Science, Physics. Summa Cum Laude.
- 1999-2003 **Utah State University (Logan, UT, USA),**
Bachelor of Science, Physics. Summa Cum Laude.
Bachelor of Science, Mathematics. Summa Cum Laude. } (4.0 GPA. Ranked 1st in graduating class).
-

SIGNIFICANT FELLOWSHIPS & SCHOLARSHIPS

2020	Emmy Noether Fellowship, Perimeter Institute, Waterloo, Canada.				
2013	Royal Society University Research Fellowship (UK) (10 years and £600K of funding). (Declined to accept position at Virginia Tech).				
2010	<table><tr><td>• Humboldt Postdoctoral Fellowship (DFG Germany)</td><td rowspan="3">} (Declined to accept position at Harvard).</td></tr><tr><td>• Fermi-McCormick Fellowship (U. Chicago)</td></tr><tr><td>• NSF International Research Fellowship</td></tr></table>	• Humboldt Postdoctoral Fellowship (DFG Germany)	} (Declined to accept position at Harvard).	• Fermi-McCormick Fellowship (U. Chicago)	• NSF International Research Fellowship
• Humboldt Postdoctoral Fellowship (DFG Germany)	} (Declined to accept position at Harvard).				
• Fermi-McCormick Fellowship (U. Chicago)					
• NSF International Research Fellowship					
2007	Apgar Scholarship, Magdalen College, University of Oxford				
2004	US National Science Foundation, Graduate Research Fellowship				
2003	Rhodes Scholarship				
2003	Marshall Scholarship (Declined to accept Rhodes)				
2001	Barry M. Goldwater Undergraduate Scholarship for Science and Engineering				
1999-2004	10 departmental and university scholarships at Utah State University.				

AWARDS

2023	College of Science Award for Diversity and Inclusion, Virginia Tech
2017-2020	Hamlett Junior Faculty Fellow, Academy of Integrated Science, Virginia Tech
2015	“Scholar of the Week”, recognized for outstanding research, Virginia Tech
2015	“Favorite Faculty Award” for undergraduate teaching, Virginia Tech
2003	Utah State University Valedictorian and Commencement Speaker
2003	Valedictorian, College of Science, Utah State University
2003-2004	Utah State University “Blue Light Honoree” for exceptional accomplishments
2002-2003	Golden Key and Phi Kappa Phi Honor Society Awards
2002	1 st Place Winner, Dirac Centennial Conference Poster Competition

Research Funding

2023-2026	NSF-PHYS-2310588 (HEP Theory) “String Compactifications: From Geometry to Effective Field Theory”, \$834, 444 over three years. PI. co-PIs J. Gray (VT) and E. Sharpe (VT).
2020-2023	NSF-PHYS-2014086 (HEP Theory) “String Compactifications: From Geometry to Effective Field Theory”, \$702, 000 over three years. co-PI. PI J. Gray (VT) and co-PI E. Sharpe (VT).
2017-2020	NSF-PHYS-1720321 (HEP Theory) “String Compactifications: From Geometry to Effective Field Theory”, \$600, 000 over three years. PI. Co-PIs J. Gray (VT) and E. Sharpe (VT).
2014-2017	NSF-PHYS-479181 “String Geometry and Phenomenology”, Total award amount: \$95, 000 over 3 years. Sole PI.
2022	Connections Workshop: Analytic and Geometric Aspects of Gauge Theory. Mathematical Sciences Research Institute (UC Berkeley) Conference Grant. (2022) Co-PI, PI L. Schaposnik (UIC). \$35, 000 to support 40 participants.
2023-2023	Geometry, Algebra and Physics of Higgs Bundles, Banff International Research Station Workshop Grant. Co-PIs, S. Rayan (U. Saskatchewan), S. Schafer-Nameki (Oxford), and L. Schaposnik (UIC). \$35, 000 to support 50 participants.
2016-2019	4-VA Competitive Research Funding for a “A Synthesis of Two Approaches to String Phenomenology”, Co-PI. Co-PI I. Melnikov (James Madison University), and PI J. Gray (VT), \$15, 000. Funding to form a “working group” between VT and JMU to host external speakers and several joint meetings between the two universities on the subject of String Phenomenology.
2016-2019	NSF-DMS-603247 Conference Grant in Algebra and Number Theory and Topology and Geometric Analysis. “A Three-Workshop Series on the Mathematics and Physics of F-theory”, \$50, 000 over three years. PI. Co-PIs M. Esole (Northeastern), P. Aluffi (Florida State) and S. T. Yau (Harvard). A workshop grant to host an annual workshop for three years focusing on F-theory with the goal of increasing dialog and collaboration between physicists and mathematicians.

2019-2020	NSF - DMS Conference Grant. “Graduate Summer School on the Physics and Mathematics of Hitchin Systems”, \$9, 100. co-PI. PI L. Schaposnik (UIC).
2017-2018	NSF - DMS Conference Grant. “Symposium on Challenges at the Interface of String Phenomenology and Geometry” \$5, 000, (Part of the events of String Phenomenology 2017). PI. Co-PI J. Gray (VT).
2017-2018	DOE -HEP Grant “String Phenomenology 2017”, to support String Phenomenology 2017 (the 16th international conference in the String Phenomenology series). \$5, 000. Co-PI. PI J. Gray (VT).
2017-2018	NSF -HEP Grant “String Phenomenology 2017”, to support the 16th international conference in the String Phenomenology series. \$10, 000. Co-PI. PI J. Gray (VT)
2016	NSF GEAR (Geometric Structures and Representation Varieties) Network Grant, \$10, 000 to host a two-day workshop on “Current trends in Spectral Data II” in 2016. Co-PI L. Schaposnik (U. Illinois, Chicago). This workshop was established in collaboration with the Association for Women in Mathematics to highlight the work of leading young female researchers.
2016	Simons Foundation Workshop Grant. One week focused workshop on “New Perspectives on Higgs Bundles, Branes, and Quantization” at the Simons Center for Geometry and Physics in 2016. Co-PIs D. Baraglia (U. Adelaide), L. Schaposnik (U. Illinois, Chicago), and V. Shende (UC Berkeley). \$35, 000 to support 50 participants.
2016-2017	Singular Geometry and Higgs Bundles in String Theory. American Institute of Mathematics, Workshop Grant. Co-PIs M. Esole (Northeastern) and L. Schaposnik (UIC). \$35, 000 to support 50 participants.
2017-2019	Physics and Geometry of Hitchin Systems. Oberwolfach Workshop grant. Co-PIs, R. Mazzeo (Stanford), L. Schaposnik (UIC) and T. Hausel (Vienna). \$30, 000 to support 40 participants.
2018-2019	Semester long program on the “Geometry and Physics of Hitchin Systems” at the Simons Center for Geometry and Physics (5 month program). Co-PI, L. Schaposnik (UIC). \$215, 000 to support thematic visitors.
2018-2019	Simons Center workshop grant (Title: “A Workshop on Challenges at the Interface of Hitchin Systems and String Theory”, March 2019) and grant to support a graduate student summer school (Title: “Graduate Summer School on the Mathematics and Physics of Hitchin Systems”, May 2019) Co-PI L. Schaposnik (UIC). \$70, 000 in total to support participants of both events.
2014	London Mathematical Society Travel grant. £3, 000 to undertake research visits and give invited talks in the UK at the University of Oxford, Imperial College London, and the University of Surrey.

Teaching Experience

POSTDOCTORAL RESEARCHERS, GRADUATE AND UNDERGRADUATE RESEARCH STUDENTS SUPERVISED

2014-2021	Postdoctoral Researchers Supervised (all co-supervised with J. Gray (VT)):
	1. Dr. Xingyang Yu (2023-present)
	2. Dr. Callum Brodie (2021-2023) (Now employed in finance).
	3. Dr. Nikhil Raghuram (2018-2021)(Now employed in research and development in the private sector)
	4. Dr. Paul Oehlmann (DFG Fellow)(2017-2019)(Now a postdoc at Northeastern University, Boston).
	5. Dr. Xin Gao (2014-2017)(Now faculty at Sichuan University, Chengdu, China)
	6. Dr. Seung-Joo Lee (2014-2017)(Now faculty at the Institute for Basic Science, Daejeon, Korea)

Graduate Students Supervised:

1. Sunit Patel (2021-present)

2. Mohsen Karkheiran. *Heterotic/F-theory Duality. Elliptically Fibered Geometry. Fourier-Mukai Transforms*. (PhD in 2020). (Now employed as a postdoctoral researcher at the Institute for Basic Science, Daejeon, Korea).
3. He Feng. *Heterotic String Theory, Sigma Models, Target Space Duality*. (PhD in 2019). (Now employed in the finance industry as a data scientist).
4. Fabio Apruzzi. *Novel Constructions of Calabi-Yau Manifolds (gCICYs)*. (PhD in 2015). Visiting student from University of Hanover co-supervised with J. Gray (VT). Spent one year at Virginia Tech. (Now faculty at the University of Padova, Italy).
5. Nick Gray. *Quaternionic Symmetry in Heterotic Compactifications*. (MS in Physics in 2015. Co-supervised with J. Gray) (Now a graduate student at North Carolina State University).

Undergraduate research students supervised (co-supervised with J. Gray (VT)):

1. Kyle Stewart (Fall 2014 and Spring 2015). *Numeric Approximations to Calabi-Yau Metrics*. Physics Department Valedictorian 2015 (now a PhD student at Auburn University)
2. Donovan Buterakos (Fall 2014 and Spring 2015). *Numeric Approximations to Calabi-Yau Metrics*. Physics Department Valedictorian 2016 (now a PhD student at the University of Maryland).
3. Joon Won Park (Fall 2015 and Spring 2016). *Non-Abelian Discrete Symmetries in Yukawa Couplings*. Grant Scholarship Recipient.
4. Brian Hammack (Fall 2016 and Spring 2017) *Non-Simply Connected Calabi-Yau Geometries and Discrete Symmetries*. (Completed Honors Thesis on discrete symmetries in Calabi-Yau Geometry, Dec. 2016). Physics Department Valedictorian 2017. (Now employed at the National Security Agency).
5. Dylan Bloothworth (Fall 2021 and Spring 2022) *Kaluza-Klein metrics on Heterotic Total Spaces*. Physics Department Valedictorian 2022.
6. Nathan Tompkins (Fall 2021 and Spring 2022) *Kaluza-Klein metrics on Heterotic Total Spaces*. Physics Department Valedictorian 2022.

UNIVERSITY LARGE COURSE TEACHING

2013-2021 **Instructor** for undergraduate and graduate level courses in the Department of Physics and the Academy of Integrated Science at Virginia Tech:

- PHYS 2305 - Foundations of Physics I (introductory physics for science and engineering students). Spring 2014, Fall 2019.
- ISC 1105 - Integrated Science I (Integrated interdisciplinary approach to 1st year Physics and 1st year Calculus for students across the sciences. Taught in an interactive SCALE-UP environment). Fall 2014, Fall 2015, Fall 2016. Fall 2018.
- ISC 1106 - Integrated Science II (Integrated interdisciplinary approach to introductory thermal and quantum physics and differential equations. Taught in an interactive SCALE-UP environment). Spring 2015.
- PHYS 4674/5674 - Introduction to General Relativity (advanced undergraduate and beginning graduate level introduction to Einstein's theory of General Relativity). Spring 2016, Spring 2017, Spring 2020. Spring 2021. Spring 2022.
- PHYS 3355 – Intermediate Mechanics (junior level undergraduate course in classical mechanics). Fall 2020, 2021, 2022, 2023.

- PHYS 2074 - Highlights of Contemporary Physics - Special Relativity Module. One month module on SR for team taught survey course for non-science majors. Fall 2017.
- PHYS 5944 - Introduction to Research Seminar. Survey of graduate research areas and professional skills. Fall 2017. Spring 2018.

UNIVERSITY SMALL GROUP SUPERVISION/TUTORIAL TEACHING

- 2006-2008 **Stipendiary Lectureship in Applied Mathematics, Pembroke College, University of Oxford.**
Responsibilities included teaching all 1st and 2nd year Applied Math and Physics subjects (responsible for 16 subjects, classes and tutorials). Subjects taught included *1st and 2nd year Calculus, Probability, Statistics, Differential Equations (ODES and PDEs), Classical Mechanics (1st and 2nd year), Quantum Mechanics, Fluid Dynamics, Electromagnetism, Special Relativity.*
- 2006 **Stipendiary Lectureship in Applied Mathematics, Somerville College, University of Oxford.**
Responsible for all 2nd – 4th year Applied Math and Physics subjects (including *General Relativity and Quantum Mechanics*).
- 2005-2006 **Retained Lecturing/Tutorial Positions in Physics and Mathematics**
At Exeter College, Brasenose College, St. Edward's Hall, Worcester College, Somerville College, and Lady Margaret Hall, University of Oxford. Subjects taught included *1st and 2nd year Calculus, Linear Algebra, Real Analysis, Probability, Statistics, Differential Equations (ODES and PDEs), Classical Mechanics (1st and 2nd year), Quantum Mechanics, Fluid Dynamics, Electromagnetism (2nd and 3rd year), Special Relativity, General Relativity.*

LECTURE SERIES (GRADUATE LEVEL/INTERNATIONAL) AND MINI-COURSES TAUGHT

- 2023 **Lecturer** at the 2023 *Summer School on Machine Learning in Mathematics and Theoretical Physics*. Gave a week long lecture series on "Numerical and Machine Learning tools for Calabi-Yau Metrics" held at the University of Oxford.
- 2022 **Lecturer** at the 2022 *Introductory Workshop on Analytic and Geometric Aspects of Gauge Theory*. Several lecture series on "Dualities and Gauge Theories in String Theory" (introductory lectures for Mathematicians).
- 2019 **Lecturer** at the 2019 *Park City Mathematics Institute (PCMI) Summer School on Quantum Field Theory and Manifold Invariants*. Two week lecture course on "Gauge Theory, Gravitation, and Geometry."
- 2018 **Lecturer** at the 2018 *CERN Winter School on Supergravity, Strings, and Gauge Theory*. One week lecture course on "Heterotic Geometry and Effective Theory".
- 2017 **Lecturer** at TASI 2017 ("*Theoretical Advanced Study Institute in Elementary Particle Physics*") at the University of Colorado, Boulder. One week lecture series on "Geometric Tools for String Compactifications".
- 2016 **Lecturer** at the 2016 "*Cargese Summer School on Quantum Gravity, Cosmology, and Particle Physics*", in Cargese, Corsica. One week lecture series on "Calabi-Yau Geometry and String Dualities".
- 2012 **Lecturer** at the "*Graduate Summer School on String Phenomenology*", Simons Center for Geometry and Physics. One Week lecture course on "Calabi-Yau Geometry".
- 2012 **Lecturer** at the "*Strings to the LHC*" Workshop in Puri, India (sponsored by the Tata Institute for Fundamental Research). One week lecture course on "Heterotic String Compactifications".

OTHER TEACHING EXPERIENCE

- 2005 **Faculty Member, The Oxford Tradition.**
Designed and taught an intensive one month, 85 hour, course in *Quantum Physics* for talented international High School students. Oxbridge Programs.
- 2004-2006 **Private mathematics tutor for students at Eton College**
Provided review and prepared pupils from Eton College for mathematics exams.
- 2004-2006 **Teaching Assistant, Mathematical Institute, University of Oxford**

Undergraduate and graduate level *Quantum Mechanics, General Relativity, Special Relativity, and Electromagnetism*. Lecturing, problem classes, and marking student work.

2003-2004 **Teaching Assistant** for Utah State University, Department of Physics. *1st and 2nd year Mechanics, Thermodynamics, Electromagnetism*. Responsibilities included lecturing, teaching recitation classes and labs, marking, and tutoring.

Professional Experience

MEMBERSHIPS AND SERVICE ROLES

- 2016-2017 **Member of the National Organizing Committee** for the American Physical Society's Conferences for Undergraduate Women in Physics.
- 2017-2024 **Member of the International Organizing Committee** for the String Phenomenology Conference Series.
- 2019-2024 **Member of the International Organizing Committee** for the Strings and Geometry Conference Series.
- 2016-2024 **Member of the National Selection Committee** for the undergraduate Goldwater Scholarships for Science and Engineering.
- 2009-2023 **Member of the US Committee of Selection for the Rhodes Scholarship** (Served on US Districts 1 (Boston), 2 (New York) and 5 (Washington DC)).
- 2019-2022 **Member of the Final Selection Committee for the Schmidt Science Fellowships**.
- 2008-2024 **Class secretary**, American Association of Rhodes Scholars.

RESEARCH MEETINGS ORGANIZED

1. String Vacuum Project Meeting at the University of Pennsylvania (2011) (Co-organized with B. Ovrut and I. Garcia-Etxebarria).
2. [The Bethe Center Workshop on Unification and String Theory](#) at Bonn University (2012). (Co-organized with T. Grimm, S. Krippendorff, H.P. Nilles, S. Schafer-Nameki and P. Vaudrevange)
3. Special Session on Supersymmetry and String Theory, [SUSY 2014](#), University of Manchester (2014). (Co-organized with M. Goodsell and A. Pilaftsis).
4. [Current trends on spectral data for Higgs Bundles II](#), Simons Center for Geometry and Physics (2016). (Co-organized with L. Schaposnik).
5. [New Perspectives on Higgs Bundles, Branes, and Quantization](#), Simons Center for Geometry and Physics (2016) (Co-organized with D. Baraglia, V. Shende and L. Schaposnik).
6. [The Physics and Mathematics of F-Theory Workshop I](#), Virginia Tech (2016) (Co-organized with P. Aluffi, M. Esole, and S. T. Yau)
7. [American Physical Society Conference for Undergraduate Women in Physics](#), Virginia Tech (2017) (Co-organized with G. Khodaparast).
8. [String Phenomenology 2017](#), Virginia Tech (2017) (Co-organized with J. Gray).
9. [Singular Geometry and Higgs Bundles in String Theory](#), American Institute of Mathematics (2017) (Co-organized with M. Esole, L. Frederickson, and L. Schaposnik).
10. [Bethe Forum on Grand Unification in the Real World](#), University of Bonn (2018). (Co-organized with H. Driener, K. Babu and S. Raby).
11. [The Physics and Mathematics of F-theory Workshop II](#), Harvard University (2018) (Co-organized with P. Aluffi, M. Esole, and S. T. Yau).

12. [The Geometry and Physics of Hitchin Systems](#), Semester long program at the Simons Center for Geometry and Physics (2019) (Co-organized with L. Schaposnik).
13. [Workshop on Challenges at the Interface of Hitchin Systems and String Theory](#), Simons Center for Geometry and Physics (2019) (Co-organized with T. Pantev, R. Mazzeo and L. Schaposnik).
14. [The Physics and Mathematics of F-theory Workshop III](#), Florida State University (2019) (Co-organized with P. Aluffi, M. Esole, and S. T. Yau).
15. [International Graduate Summer School on the Mathematics and Physics of Hitchin Systems](#), Simons Center for Geometry and Physics (2019) (Co-organized with S. Katz, J. Teschner and L. Schaposnik).
16. [Oberwolfach Workshop on the Geometry and Physics of Higgs Bundles](#), Oberwolfach, Germany (2019) (Co-organized with R. Mazzeo, L. Schaposnik, and T. Hausel).
17. [Connections Workshop: Analytic and Geometric Aspects of Gauge Theory](#), MSRI, UC Berkeley (2022) (Co-organized with L. Schaposnik and C. Kelleher).
18. Banff Workshop on “The Geometry, Algebra, and Physics of Higgs Bundles”, Banff International Research Station (2023). (Co-organized with S. Rayan, S. Schafer-Nameki and L. Schaposnik).
19. KITP semester-long program on “What is string theory? Weaving perspectives together”, KITP, UC Santa Barbara (Spring 2024). (Co-organized with R. Gopakumar, M. Ragnamani, and X. Yin).
20. KITP Conference on “Spacetime and String Theory” (April 2024) (Co-organized with T. Hartmann, R. Gopakumar and X. Yin).

PROFESSIONAL SERVICE

- 2004-2024 **Reviewer/Referee for Journals** including AMS, Math. Rev., Can. Jour. of Phys., Phys. Rev.D, Comm. Math. Phys., JMP, JHEP, Adv. High Energy Phys., Galaxies, zbMATH (formerly Zentralblatt MATH), Microsoft Conferences, and SciPost.
- 2017-2023 Member of the Editorial Board of *Journal of Physics Communications* (IoP).
- 2020-2022 Member of the Editorial Board for *Universe* (MDPI).
- 2014-2024 **Reviewer** for the US National Science Foundation (HEP Theory and Nuclear Theory programs), the Engineering and Physical Science Research Council (UK), the FWF Austrian Science Fund, the Swiss National Science Foundation, the European COST (Cooperation in Science and Technology) Program and the Italian Ministry of Education, Universities and Research (MIUR).
- 2019-2024 NSF Panelist: HEP-Theory (PHYS Division) and Symplectic Geometry Inspired by Theoretical Physics (DMS Division).
- 2008-2022 **Seminar Organizer** at the University of Pennsylvania, Harvard University, and Virginia Tech.
- 2015-2019 **Member** of the Undergraduate Curriculum Committee, Department of Physics, Virginia Tech.
- 2016-2023 **Elected Member** of the Executive Committee in the Department of Physics, Virginia Tech (elected committee to advise the Department Chairman).
- 2016-2018 **Member** of the Selection Committee for the Honors Odyssey Sophomore Scholarships, Virginia Tech.
- 2013-2021 **Member of Faculty Hiring Committees** for the Academy of Integrated Science, the Department of Mathematics and the College of Science at Virginia Tech.
- 2006-2008 **Interviewer** for undergraduate admissions in Mathematics, University of Oxford. (Wrote entrance exam questions and conducted hundreds of prospective student interviews).
-

Efforts towards Science Outreach & Diversity

- 2022-2024 **Co-organizer** of a Peer Mentoring Program in the Department of Physics at Virginia Tech.
- 2017 **Organizer** for a 2017 American Physical Society Conference for Undergraduate Women in Physics. The APS CUWiP Conferences are the major effort of the APS to support and mentor female physics students in physics.
- 2016 **Speaker** at the 2016 American Physical Society Conference for Undergraduate Women in Physics at Old Dominion University.
- 2020-2021 **Chair** of the Committee for Inclusion and Diversity, College of Science, VT.
- 2019-2022 **Chair** of the Diversity Committee, Department of Physics, VT.
- 2019-2022 **Member** of the Inclusion and Diversity Committee, College of Science, VT.
- 2016-2018 **Member** of the Department of Physics Working Group on Diversity, Virginia Tech.
- 2015-2024 **Member** of the *Women in High Energy Physics Network*. I serve as a mentor and provide support for women (currently under-represented in particle physics).
- 2022 **Speaker** on theoretical physics as part of the Virginia Tech *Physical Science* Summer Camp for under-represented students.
- 2015-2016 **Speaker** on mathematics/physics as part of the Virginia Tech *Summer Bridge Program* (an initiative that helps prepare under-represented/minority students in the physical and quantitative sciences prepare for their first semester at university).
- 2016 **Speaker** as part of the *C²-Tech Summer Camp* (for regional female high school students interested in STEM subjects) at Virginia Tech
- 2013-2021 **Mentor** for the Virginia Tech Undergraduate Honors Program
- 2013-2024 **Mentor** for the “Ladies of Robeson” Society of Undergraduate Women in Physics at Virginia Tech.
- 2015-2024 **Mentor** for the “African Scholars Network”, providing career/CV advice to African scientists applying for PhD/Postdoctoral/Faculty positions.
- 2014-2024 **Organizer** in collaboration with the “Women in Leadership and Philanthropy Endowed Lecture Fund”, the “Minority Artists and Scholars Lecture Series”, “Advance VT” and the “Sowers Lecture Series”, have organized the visits of multiple prominent female and minority physicists/mathematicians to Virginia Tech (each event included arranging mentoring events/receptions with female students).
- 2011-2013 **Volunteer with TheoryNet Boston** - Science outreach lecturer in public schools in the Boston area.
- 2005-2008 **Participant in the “Researchers in Residence” program** – A program of the UK National Research Councils that places science researchers in secondary schools for outreach lectures, projects, and demonstrations.
- 2005 **United States Delegate**
World Conference on Physics and Sustainable Development Delegate and presenter at UNESCO funded conference, Durban, SA. (Oct. 2005).
- 2004 **Lecturer in the “Road Scholars” tour** – An educational outreach tour of Utah Secondary Schools. Delivered talks and lectures in schools on topics in modern physics.
- 2003 **Science Recruitment**: Narrator and co-designer of the USU College of Science’s “Think Science” undergraduate recruitment video.
- 2003 **Organizer and creator of the “Cool Ideas in Science!” workshop** – A two-day community workshop for students of all ages and their families providing hands on exploration of fundamental ideas in science and examples of exciting, current research.
- 1999-2002 **Member of the NASA sponsored “Get Away Special” Team**
A student led program to design and build experimental payloads to be flown on the space shuttle. Designed and programmed the microcomputer system for the experiments as well as the environmental control circuits and data analysis programs. Payload flew on the Space Shuttle Endeavour in 2001.
- 1999-2002 **Science Mentor** Boy Scouts of America (Logan, UT). Designed educational science/mathematics activities.
- 2008-2019 **Popular press articles**
I have given interviews and wrote pieces on my work, on diversity issues and my experience as a

woman in physics/mathematics: [USU Alumni Magazine](#), [Hamlett Fellowship](#), [CUWiP 2017](#), [Simons Center Newsletter](#), [2015 VT Scholar Profile](#), [Women in Science](#), [The Rhodes Project](#), [USU Student Profile](#), [Deseret News](#), [Herald Journal](#).

LARA B. ANDERSON – PUBLICATION LIST

Journal Articles

(Asterisks indicates a paper written with postdocs (*), graduate students (**), or undergraduate students (***) in my group, respectively.)

1. L.B. Anderson, J. Gray, and M. Larfors, “Lectures on Numerical and Machine Learning Methods for Approximating Calabi-Yau Metrics”, peer-reviewed chapter contributed to *Tutorials on Machine Learning for Mathematics and Physics* (to appear, Springer, 2024).
2. L.B. Anderson, J. Gray and P. K. Oehlmann*, “Twisted Fibrations in M/F-theory”, **JHEP** 01 (2024) 017. arXiv:2308.07364.
3. L.B. Anderson, C. Brodie* and J. Gray, “Branes and bundles through conifold transitions and dualities in heterotic string theory”, *Phys.Rev.D* **108** (2023) 10, 106018. arXiv:2211.05804.
4. L.B. Anderson, J. Gray, and P. K. Oehlmann*, “Calabi-Yau Genus-One Fibrations and Twisted Dimensional Reductions of F-theory”, Accepted and to appear in Proceedings of the Nankai Symposium on Mathematical Dialogs (Springer, 2024). (Peer-reviewed conference proceedings). arxiv:2308.12826.
5. L.B.Anderson, J. Gray, M. Larfors and M. Magill**, “Vanishing Yukawa Couplings and the Geometry of String Theory Models”, Accepted and to appear in Proceedings of the Nankai Symposium on Mathematical Dialogs (Springer, 2024). (Peer-reviewed conference proceedings). arXiv: 2201.10357.
6. L.B. Anderson, J. Gray, M. Karkheiran**, P. Oehlmann*, N. Raghuram*, “ \mathbb{P}^1 -fibrations in F-theory and String Dualities”, *Pure Appl.Math.Quart.* **18** (2022) 4, 1264-1354. arXiv:2109.11534.
7. L.B. Anderson, J. Gray, M. Larfors, M. Magill**, and R. Schneider**, “Generalized Vanishing Theorems for Yukawa Couplings in Heterotic Compactifications”, **JHEP** 05:085 (2021). arXiv:2103.10454.
8. L.B. Anderson, M. Gerdes, J. Gray, S. Krippendorf, N. Raghuram*, and F. Ruehle, “Moduli-dependent Calabi-Yau and $SU(3)$ -structure metrics from Machine Learning”, **JHEP** 05:013 (2021). arXiv:2012.04656.
9. L.B. Anderson, J. Gray, A. Lukas and J. Wang**, “Chern-Simons invariants and heterotic superpotentials”, **JHEP** 09:141 (2020). arXiv:2006.03082.
10. L.B. Anderson, X. Gao and M. Karkheiran**, “Extending the Geometry of Heterotic Spectral Cover Constructions”, *Nuc. Phys. B* **956** (2020) 115003. arXiv:1912.00971.
11. L.B. Anderson, H. Feng**, X. Gao, and M. Karkheiran**, “Heterotic/Heterotic and Heterotic/F-theory Duality”, *Phys.Rev. D* **100** (2019), no. 12. 126014. arXiv:1907.04395.
12. L.B. Anderson, J. Gray, and P. K. Oehlmann*, “F-theory on Quotients of Elliptic Calabi-Yau Threefolds”, **JHEP** 1912:131 (2019). arXiv:1906.11955.
13. L. B. Anderson, J. Gray, and B. Hammack***, “Fibrations in Non-Simply Connected Calabi-Yau Quotients”, **JHEP** 1808:128 (2018). arXiv:1805.05497.
14. L.B. Anderson, M. Karkheiran**, “TASI Lectures on Geometric Tools for String Compactifications”, *TASI 2017: Theoretical Advanced Study Institute Summer School 2017*, “Physics at the Fundamental Frontier”, **Proc. of Science** Vol. 305, (2018) 013. arXiv:1804.08792.
15. L.B. Anderson, A. Grassi, J. Gray, and P. K. Oehlmann*, “F-theory on Quotient Threefolds with $(2, 0)$ Discrete Superconformal Matter”, **JHEP** 1806:098 (2018). arXiv:1801.08658.

16. L.B. Anderson, L. Frederickson, M. Esole, and L. Schapsonik, “Singular geometry and Higgs bundles in string theory”, **SIGMA** **14** (2018) 037. arXiv:1710.08453.
17. L.B. Anderson, X. Gao*, J. Gray, and S.J. Lee*, “Fibrations in CICY Threefolds”, **JHEP** **1710**:077. arXiv:1708.07907.
18. L. B. Anderson, J. Heckman, S. Katz and L. Schaposnik, “T-branes at the Limits of Geometry”, **JHEP** **1710**:058 (2017). arXiv:1702.06137.
19. L.B. Anderson, X. Gao*, J. Gray, and S.J. Lee*, “Multiple fibrations in Calabi-Yau Geometry and String Dualities”, **JHEP** **1610** : 105 (2016). arXiv:1608.07555.
20. L.B. Anderson, X. Gao*, J. Gray, and S.J. Lee*, “Tools for CICYs in F-theory”, **JHEP** **1611** : 004 (2016). arXiv:1607.04628.
21. L. B. Anderson and H. Feng**, “New Evidence for (0,2) Target Space Duality”, **J.Phys.A** **50** (2017) no.6, 064004. arXiv:1607.04628.
22. L.B. Anderson, “Spectral Covers, Integrality Conditions, and Heterotic/F-theory Duality”, **J. of Singularities** **15**, (2016), 1. arXiv:1603.09198.
23. L.B. Anderson, J. Gray, N. Raghuram, and W. Taylor, “Matter in Transition”, **JHEP** **1604** : 080 (2016). arXiv:1512.05791.
24. L.B. Anderson, F. Apruzzi**, X. Gao*, J. Gray, and S. J. Lee*, “Instanton superpotentials, Calabi-Yau geometry, and fibrations”, **Phys.Rev. D** **93** (2016) no.8, 086001. arXiv:1511.05188.
25. L.B. Anderson, F. Apruzzi**, X. Gao*, J. Gray, and S. J. Lee*, “A new construction of Calabi-Yau manifolds: Generalized CICYs”, **Nuc.Phys.B** **906** (2016) 441. arXiv:1507.03235.
26. L.B. Anderson, A. Constantin, S. J. Lee*, and A. Lukas, “Hypercharge Flux in Heterotic Compactifications”, **Phys.Rev. D** **91** (2015) 4, 046008. arXiv:1411.0034.
27. L.B. Anderson, I. Garcia-Etxebarria, T. W. Grimm and J. Keitel, “Physics of F-theory compactifications without section”, **JHEP** **1412** : 156 (2014). arXiv:1406.5180.
28. L.B. Anderson and W. Taylor, “Geometric constraints in dual F-theory and heterotic string compactifications”, **JHEP** **1408** : 025, 2014. arXiv:1405.2074.
29. L.B. Anderson, J. Gray and E. Sharpe, “Algebroids, Heterotic Moduli Spaces and the Strominger System”, **JHEP** **1407** : 037, 2014. arXiv:1402.1532.
30. L.B. Anderson, J. Heckman and S. Katz, “T-Branes and Geometry”, **JHEP** **1405** : 080, 2014, arXiv:1310.1931
31. L.B. Anderson, A. Constantin, J. Gray, A. Lukas and E. Palti, “A Comprehensive Scan for Heterotic SU(5) GUT models”, **JHEP** **1401** : 047, 2014. arXiv:1307.4787 [hep-th].
32. L.B. Anderson, B. Jia, R. Manion, B. Ovrut and E. Sharpe, “General aspects of heterotic string compactifications on stacks and gerbes”, **Adv. Theor. Math. Phys** **19** (2015), 531-611. arXiv:1307.2269 [hep-th].
33. L.B. Anderson, J. Gray, A. Lukas and B. Ovrut, “Vacuum Varieties, holomorphic bundles and complex structure stabilization in Heterotic Theories”, **JHEP** **1307** : 017, 2013, arXiv:1304.2704 [hep-th].
34. L.B. Anderson, J. Gray, A.Lukas and E. Palti, “Heterotic Line Bundle Standard Models”, **JHEP** **1206** : 113, 2012, arXiv:1202.1757 [hep-th].
35. L.B. Anderson, J. Gray, A.Lukas and B. Ovrut, “The Atiyah Class and Complex Structure Stabilization in Heterotic Calabi-Yau Compactifications.”, **JHEP** **1110** : 032, 2011, arXiv:1107.5076 [hep-th].
36. L.B. Anderson, J. Gray, A. Lukas, and E. Palti “Two Hundred Heterotic Standard Models on Smooth Calabi-Yau Threefolds”, **Phys.Rev. D** **84**, 2011 106005. arXiv:1106.4804 [hep-th].

37. L.B. Anderson, V. Braun and B. Ovrut, “Numerical Hermitian Yang-Mills Connections and Kähler Cone Substructure”, **JHEP** 1201 : 014, 2012. arXiv:1103.3041 [hep-th].
38. L.B. Anderson, J. Gray, A. Lukas and B. Ovrut, “Stabilizing All Geometric Moduli in Heterotic Calabi-Yau Vacua”, **Phys.Rev.** **D83**, 2011, 106011. arXiv:1102.0011 [hep-th].
39. L.B. Anderson, J. Gray, and B. Ovrut, “Transitions in the Web of Heterotic Vacua”, **Fortschr. Phys.** **59**, No. 5 – 6, 327 – 371 (2011). arXiv:1012.3179 [hep-th].
40. L.B. Anderson, J. Gray, A. Lukas and B. Ovrut, “Stabilizing the Complex Structure in Heterotic Calabi-Yau Vacua”, **JHEP** 1102 : 088, 2011. arXiv:1010.0255 [hep-th].
41. L. B. Anderson, V. Braun, R. Karp and B. Ovrut, “Numerical Hermitian Yang-Mills Connections and Vector Bundle Stability in Heterotic Theories”, **JHEP** 1006 : 107, 2010. arXiv:1004.4399 [hep-th]
42. L.B. Anderson, J. Gray and B. Ovrut, “Yukawa Textures from Heterotic Stability Walls”, **JHEP** 1005 : 086, 2010. arXiv:1001.2317 [hep-th]
43. L.B. Anderson, J. Gray, Y.H. He and A. Lukas, “Exploring Positive Monads and A New Heterotic Standard Model”, **JHEP** 1002 : 054, 2010. arXiv:0911.1569 [hep-th]
44. L.B. Anderson, J. Gray, A. Lukas and B. Ovrut, “Stability Walls in Heterotic Theories”, **JHEP** 0909 : 026, 2009. arXiv:0905.1748 [hep-th]
45. L.B. Anderson, J. Gray, D. Grayson, Y.H. He and A. Lukas, “Yukawa Couplings in Heterotic Compactification”, **Commun.Math.Phys.** **297** : 95 – 127, 2010. arXiv:0904.2186 [hep-th].
46. L.B. Anderson, J. Gray, A. Lukas and B. Ovrut, “The Edge of Supersymmetry: Stability Walls in Heterotic Theories”, **Phys.Lett.** **B677** : 190 – 194, 2009, arXiv:0903.5088 [hep-th].
47. L.B. Anderson, Y.H. He, and A. Lukas, “Monad Bundles in Heterotic String Compactifications”, **JHEP** 0807 : 104, 2008. arXiv:0805.2875 [hep-th].
48. L. B. Anderson, Y.H. He, and A. Lukas, “Heterotic Compactification, An Algorithmic Approach”. **JHEP** 0707 : 049, 2007. hep-th/0702210.
49. L.B. Anderson, A. Barrett, and A. Lukas, “Four-dimensional Effective M-theory on a Singular $G(2)$ Manifold”. **Phys.Rev.** **D74** : 086008, 2006. hep-th/0606285.
50. L.B. Anderson, A. Barrett, and A. Lukas, “M-theory on the Orbifold C^2/Z_N ”. **Phys.Rev.** **D73** : 106011, 2006. hep-th/0602055.
51. L.B. Anderson, J.T. Wheeler, “Yang Mills Gravity in Biconformal Space”. **Class.Quant.Grav.** **24** : 475 – 496, 2007. hep-th/0412293.
52. L.B. Anderson, J.T. Wheeler, “Quantum Mechanics as a Measurement Theory on Biconformal Space”, **Int.Jour.Geom. Meth.Mod.Phys.** **3** : 315, 2006. hep-th/0406159.
53. L.B. Anderson, J.T. Wheeler, “Biconformal Supergravity and the AdS/CFT Conjecture”, **Nuc. Phys.** **B686** : 285 – 309, 2004. hep-th/0309111.

Other Publications

1. L. B. Anderson and L. Schaposnik (Editors, co-authored Forward), “Special Issue on the Geometry and Physics of Hitchin Systems”, **SIGMA** 2019.
2. L.B. Anderson, “An algorithmic approach to heterotic phenomenology”, **AIP Conf. Proc.** **1900** (2017) no. 1, 02001.

3. L.B. Anderson, “The Geometry of Matter Transitions in Heterotic/F-theory Duality”, Proceedings of the XVII International Congress on Mathematical Physics (2016).
4. L.B. Anderson, “Exploring novel geometry in Heterotic/F-theory Dual Pairs”, Proc.Symp.Pure Math. **88** (2014) 209-220.
5. L.B. Anderson, J. Gray, A. Lukas and E. Palti, “Heterotic standard models from smooth Calabi-Yau three-folds”, Proceedings of 11th Hellenic School and Workshops on Elementary Particle Physics and Gravity (CORFU2011).
6. L.B. Anderson, “Heterotic and M-theory Compactifications for String Phenomenology”, Univ. of Oxford, PhD Thesis, 2008. arXiv:0805.2875[hep-th].
7. L. B. Anderson, “Biconformal supergravity and a quantum theory of biconformal space”. Utah State University M.S. thesis. 2004.

Invited Talks & Presentations

1. ”Bounding/Characterizing String Geometries”, SUSY 2024, University of Southampton, Southampton, UK. (07/23).
2. “Lectures on Numerical and Machine Learning Methods for Approximating Ricci-flat Calabi-Yau Metrics”, 1 week lecture course in Machine Learning in Mathematics and Theoretical Physics Summer School, University of Oxford, Oxford, UK. (07/23).
3. “Characterizing/bounding geometries and geometric transitions in string compactifications”, Theoretical Tests of the Landscape Workshop, University of Massachusetts, Amherst, MA. (04/23).
4. “New Perspectives on Heterotic Conifold Transitions”, Strings and Geometry Conference. University of Pennsylvania, Philadelphia, PA. (03/23).
5. “Physical Perspectives on Gauge Theories and Dualities”, SLMath (formerly MSRI) Workshop on *Analytic and Geometric Aspects of Gauge Theory*, SLMath, Berkeley, CA. (08/22).
6. “Discrete Symmetries and Twisted Dimensional Reductions of F-theory”, Particle Theory Seminar, Texas AM, College Station, TX. (05/22).
7. “Possibilities in Theory”, Colloquium, University of Mary Washington, Fredericksburg, VA. (03/22).
8. “Calabi-Yau and SU(3) Structure Metrics and Stable Bundles”, String Data 2021, University of Witwatersrand, Johannesburg, South Africa. (Online, Plenary talk). (12/21).
9. “Calabi-Yau and SU(3) Structure Metrics from Machine Learning”, Indian Strings Meeting 2021, Indian Institute of Technology, Roorkee, India. (Online, Plenary talk). (12/21).
10. “Progress in Heterotic Compactification and Phenomenology”, KEK Theory Workshop, KEK, Tsukuba, Japan. (Online, Plenary Talk). (12/21).
11. “New Aspects of Heterotic Compactification Geometry”, Geometry Seminar, University of British Columbia, Vancouver, Canada. (Online talk). (11/21).
12. ”Hidden Dimensions in String Theory”, Nauka o+, Russian National Science Festival. Moscow, Russia. (Online public lecture (translated into Russian)). (10/21).
13. “ \mathbb{P}^1 -fibrations and Heterotic/F-theory Duality”, Strings in Seoul 2021 Workshop, Korean Institute for Advanced Studies, Seoul, Korea (Online plenary talk). (9/21).
14. “Elliptic Calabi-Yau Geometry and twisted dimensional reductions of F-theory”, Nankai Symposium on Mathematical Dialogues 2021, Nankai University, Nankai, China. (Online plenary talk). (08/21).

15. “Constraints in Smooth Heterotic Compactifications”, String Phenomenology 2021. Northeastern University, Boston, USA. (Online plenary talk). (7/21).
16. “ $SU(3)$ -Holonomy and $SU(3)$ -Structure Metrics from Machine Learning”, PLANCK 2021, Institute for Particle Physics Phenomenology, Durham University, Durham, UK. (Online plenary talk). (06/21).
17. “Progress in String Compactifications”, STRINGS 2021, ICTP-SAIFR, Sao Paulo, Brazil. (Online plenary talk). (06/21).
18. “Twisted Dimensional Reductions in F-theory”, String Math 2021, IPMA, Rio de Janeiro, Brazil. (Online plenary talk). (06/21).
19. “ $SU(3)$ -Holonomy and $SU(3)$ -Structure Metrics from Machine Learning”. Simons Workshop on Numerical and Geometric Methods for Ricci-flat Metrics and Flows, Simons Center for Geometry and Physics, (Online plenary talk). (5/21).
20. “String Compactifications and Hitchin Systems”, UC Davis Math/Physics Seminar, (Online talk). (2/21).
21. “String Compactifications and Hitchin Systems”, Banff Workshop on Geometry, Analysis and Quantum Physics of Monopoles, Banff Canada (Online Plenary talk). (2/21).
22. “The Geometry of String Compactifications”, Colloquium, Perimeter Institute, Waterloo, Canada (Online Colloquium). (12/20).
23. “Topological Textures in Heterotic Theories”, CERN Theory Seminar, CERN, Geneva, Switzerland (Online seminar). (12/20).
24. “Panel Discussion of G_2 Compactifications in String Theory”, G_2 Holonomy Simons Collaboration Meeting, Simons Center for Geometry and Physics, Stony Brook, NY. (Online plenary panel discussion). (10/20).
25. “Higgs Bundles in String Compactifications”, AIM Workshop on Special Holonomy and Branes, American Institute of Mathematics, San Jose, CA. (Online plenary talk). (10/20).
26. “An Overview of Calabi-Yau Elliptic Fibrations”, Elliptics and Beyond Conference, Mainz Institute for Theoretical Physics, Mainz, Germany. (Online plenary talk). (09/20).
27. “The Swampland Program and String Geometry”, Theoretical Tests of the Swampland Workshop, University of Massachusetts, Amherst, MA. (10/19).
28. Two-week lecture course on “Gauge Theory, Gravitation, and Geometry”, Park City Mathematics Institute (PCMI) 2019 Summer School on *Quantum Field Theory and Manifold Invariants*, Park City, UT, (07/19).
29. “New Aspects of Heterotic Geometry”, String Math 2019, University of Uppsala, Uppsala, Sweden (07/19).
30. “A New Approach to Heterotic Moduli and Dualities”, String Phenomenology 2019, CERN, Geneva, Switzerland, (06/19).
31. “Heterotic/Heterotic and Heterotic/F-theory Duality”, Theoretical Particle Physics Seminar, University of Pennsylvania, (02/19).
32. “The Geometry and Physics of Hitchin Systems”, Colloquium, Simons Center for Geometry and Physics (02/19).
33. “String Compactifications: Geometry and Field Theories”, Physics Department Colloquium, Virginia Tech, (10/18).
34. “Heterotic/Heterotic and Heterotic/F-theory Duality”, String Theory, Geometry and String Model Building Conference, Mainz Institute for Theoretical Physics, Johannes Gutenberg University, Mainz, Germany, (09/18).
35. “Calabi-Yau Fibrations, Finiteness, and Dualities”, STRINGS 2018, OIST, Okinawa, Japan, (06/18).

36. “Calabi-Yau Fibrations in String Theory”, Math/Physics Seminar, Purdue University, (04/18).
37. Lecture series on “Heterotic Geometry and Effective Theories”, 2018 CERN Winter School on Supergravity, Strings and Gauge Theory, CERN, Geneva (Switzerland), (02/18).
38. “Enumerating Calabi-Yau Fibrations”, Physics and Geometry of F-theory Workshop, Banff International Research Station, Banff, Canada (01/18).
39. “Fibrations in Complete Intersection Calabi-Yau manifolds”, Enumerative Geometry, Mirror Symmetry, and Physics Conference, University of Illinois, Urbana-Champaign, (07/17).
40. “Geometric Tools for String Compactifications”, 1 week lecture series, Theoretical Advanced Studies Institute (TASI 2017), University of Colorado, Boulder (06/17).
41. “String Geometry and Phenomenology”, DAMTP Seminar, University of Cambridge, UK, (05/17).
42. “Multiple Fibrations and String Dualities”, Theory Seminar, University of Maryland, (10/16).
43. “Multiple Fibrations and String Dualities”, ‘Strings and Particles at Ohio, Cincinnati, and Kentucky’ (SPOCK) Meeting, University of Cincinnati (10/16)
44. “Heterotic Compactifications, model building and target space duality”, Theory Seminar, University of Cincinnati, (10/16).
45. “Multiple Fibrations in Calabi-Yau Geometry and String Dualities”, Workshop on ‘Singular Spaces in String and M-theory’, Fields Institute, Toronto (Canada), (08/16).
46. “An Algorithmic Approach to Heterotic Standard Models”, CETUP* Neutrino Physics and Unification Workshop, Lead, South Dakota, (06/16).
47. “F-theory, Flux, and Singular Geometry”, String Phenomenology 2016, University of Ioannina, Ioannina (Greece), (06/16).
48. Lecture Series on “Calabi-Yau Geometry and String Dualities”, Cargese Summer School on Quantum Gravity, Cosmology and Particle Physics, Cargese (Corsica), (06/16).
49. “New Evidence for $(0, 2)$ Target Space Duality”, ‘ $(0, 2)$ Workshop’, Henri Poincare Institute, Paris (France), (05/16)
50. “ $(0,2)$ Target Space Duality”, Algebraic Geometry Group Meeting, University of Illinois, Urbana-Champaign, (04/16).
51. “String Compactification and Geometry”, Mathematics Department Seminar, University of Illinois, Chicago, (04/16).
52. “String Compactification and Geometry”, Mathematics Department Colloquium, Utah State University, (03/16).
53. “Matter Transitions and Heterotic/F-theory Duality”, ‘F-theory at 20’ Conference, Caltech, (02/16).
54. “Resume/Presentation/Interview Skills”, APS Conference for Undergraduate Women in Physics, Old Dominion University, (01/16).
55. “Heterotic/F-theory Compactifications and Geometry”, Session on ‘Fibrations, Mirror Symmetry, and Calabi-Yau Geometry’, Canadian Mathematical Society Meeting, Montreal (Canada), (12/15).
56. “Generalized CICYs - Fibrations and Transitions”, String Group Seminar, MIT Center for Theoretical Physics, (11/15).
57. “Matter Transitions and Heterotic/F-theory Duality”, Theory Seminar, University of Pennsylvania, (11/15).
58. “String Phenomenology and Geometry”, Colloquium, James Madison University, (10/15).

59. “Calabi-Yau geometry and Emergent Hitchin Systems”, Higgs Bundle Workshop, American Institute of Mathematics (09/15).
60. “F-theory, Dualities and Geometry”, Harvard University, Mathematical Sciences String Workshop, (08/15).
61. “Heterotic/F-theory Compactifications and Geometry”, International Congress on Mathematical Physics, Santiago, Chile (07/15).
62. “New branches of heterotic/F-theory duality”, String Phenomenology 2015, University Automata Madrid (Spain), (06/15).
63. “New results in heterotic/F-theory duality”, Particle Theory Seminar, Uppsala University (Sweden), (05/15).
64. “An algorithmic approach to heterotic string compactification”, Particle Seminar, University of Virginia, (03/15).
65. “Heterotic Standard Models and Hypercharge Flux”, “String/M-theory Compactifications and Moduli Stabilization” Workshop, University of Michigan (03/15).
66. “Fibration Structures and Duality in F-theory”, “Physics and Geometry of F-theory” Workshop, Max Planck Institute for Physics, Germany (03/15).
67. “Heterotic/F-theory geometry”, Korean Institute for Advanced Study String Seminar (01/15).
68. “Hidden Geometry in Heterotic/F-theory duality”, Ewha University, Seoul, Korea (01/15).
69. “Heterotic Standard Models and Hypercharge Flux”, MIT Theory Seminar (11/14).
70. “A search for fundamental physics”, Virginia Tech “Master Teacher” public lecture, University President’s Inauguration (10/14).
71. “New Geometry in Heterotic/F-theory Duality”, Theory Seminar, UT Austin (10/14).
72. “String Compactification and Geometry”, Department of Mathematics, Colloquium. Virginia Tech, (09/14)
73. “Heterotic Standard Models, Hypercharge Flux, and Moduli Spaces”, String Seminar, University of North Carolina at Chapel Hill, (09/14).
74. “A singular definition of F-theory”, “String Theory and its Applications Program” Institute for Theoretical Physics, Mainz University (09/14).
75. “Hidden Geometry in Dual Heterotic/F-theory Compactifications”, STRINGS 2014 Plenary Talk. (06/14).
76. “The Geometry of Heterotic/F-theory Duality”, Macaulay 2 Conference, U. Illinois Urbana-Champaign, (06/14).
77. “Geometric Constraints in Heterotic/F-theory Duality”, Theory Seminar, Imperial College London (05/14).
78. “Geometric Constraints in Heterotic/F-theory Duality”, String Seminar, Mathematical Institute, University of Oxford (05/14).
79. “Geometric Constraints in Heterotic/F-theory Duality”, Fields, Strings and Geometry Seminar, University of Surrey (05/14).
80. “Geometry and Duality in String Compactifications”, Algebra Seminar, Virginia Tech Department of Mathematics, (04/14)
81. “Geometric Constraints in Heterotic/F-theory Duality”, Southeast Regional Mathematical String Theory Meeting, Duke University, (04/14).
82. “The Geometry of Heterotic/F-theory Duality”, AMS Southeastern Spring Sectional Meeting, Special session on Singularities and Physics, University of Tennessee. (03/14).

83. “Moduli stabilization and supersymmetry breaking in heterotic string theory”, ”Supersymmetry Breaking in String Theory Workshop” Isaac Newton Institute for Mathematical Sciences, University of Cambridge (03/14).
84. “Heterotic/F-theory Duality: A modern Review”, “Geometry and Physics of F-theory Workshop”, University of Heidelberg, (02/14).
85. “Geometric Constraints in Heterotic/F-theory Duality”, “Calabi-Yau Geometry and Mirror Symmetry Conference”, National Taiwan University, (01/14)
86. “T-branes and Geometry”, Brandeis University Theory Seminar, (10/13).
87. “New Aspects of Heterotic/F-theory Duality”, String Math 2013, Simons Center for Geometry and Physics, Stony Brook University (06/13).
88. “New Aspects of Heterotic/F-theory Duality”, PLANCK 2013, University of Bonn (Plenary Speaker), (05/13).
89. “Vacuum Varieties, Holomorphic Bundles and Complex Structure Stabilization”, Harvard Math Department Seminar, (4/13).
90. “Vacuum Varieties, Holomorphic Bundles and Complex Structure Stabilization”, University of Illinois, Urbana-Champaign, Joint Math-Physics Seminar, (4/13).
91. “Global Issues in Vector Bundle Deformation Theory”, University of Waterloo, Mathematics Department Seminar, (3/13).
92. “String Geometry”, College of Science Colloquium, Virginia Tech University, (2/13)
93. “Heterotic Compactifications”, Three lecture series, Strings to the LHC III, Puri, India (12/12).
94. “Exploring the Moduli Space of Heterotic Standard Models”, MIT String Seminar, (10/12).
95. “New Aspects of Heterotic/F-theory Duality”, Bethe Forum for Theoretical Physics, University of Bonn, (09/12).
96. “Heterotic Geometry and Deformation Theory”, Generalized Geometry, String Theory, and Deformations Conference, Harvard University, (08/12).
97. “New Aspects of Heterotic Geometry and Phenomenology”, STRINGS 2012, LMU Munich, (07/12).
98. “Heterotic Vector Bundles, Deformations and Geometric Transitions”, String Math 2012, University of Bonn, (07/12)
99. “String Compactification and Calabi-Yau Geometry”, Five Lecture Series, Graduate Workshop on String Phenomenology, Simons Center for Geometry and Physics, (07/12)
100. “Vector Bundles and Moduli Stabilization in Heterotic Theories”, String Pheno 2012 (Plenary Speaker), Isaac Newton Institute, University of Cambridge, (06/12).
101. “Standard Models and Moduli Stabilization in Heterotic Theories”, Northeastern University, (04/12).
102. “Algorithmic String Geometry”, Univ. of New Hampshire, Theory Seminar, (04/12).
103. “Algorithmic String Geometry”, Brown University, Theory Seminar, (04/12).
104. “Algorithmic String Geometry”, Triangle Seminar (Kings College London, Imperial College London, Queen Mary University London, and City University London), (01/12).
105. “Line Bundle Standard Models”, Isaac Newton Institute for Mathematical Sciences, Mathematics of Strings and Branes Workshop, Cambridge University, (01/12).
106. “Line Bundle Standard Models”, Institute for Advanced Study, Princeton. Theory Seminar, (11/11).

107. “Line Bundle Standard Models”, Max Planck Institute for Physics, High Energy Seminar, Munich, Germany, (10/11).
108. “An Algorithmic Approach to String Phenomenology”, University of Minnesota, High Energy Seminar, (10/11)
109. “Heterotic Moduli Stabilization”, Harvard University, String Lunch Seminar, (09/11)
110. “An Algorithmic Approach to String Phenomenology” SUSY 2011, Fermilab, (08/11).
111. “Complex Structure Stabilization”, String Pheno 2011(Plenary Speaker), Univ. of Wisconsin, Madison, (08/11).
112. “Heterotic Moduli Stabilization”, String Math 2011, University of Pennsylvania, (06/11).
113. “Moduli Stabilization and Vacuum Structure”, String Vacuum Project Meeting 2011, University of Pennsylvania, (05/11).
114. “Geometric Moduli Stabilization in Heterotic Vacua”, UT Austin, High Energy Theory Seminar, (04/11)
115. “Geometric Moduli Stabilization in Heterotic Vacua”, Texas A&M Univ., Theory Seminar, (04/11)
116. “Supersymmetry and Geometric Moduli Stabilization in Heterotic Vacua”, SPOCK Meeting, U. Cincinnati, (03/11)
117. “Toric CICY fourfolds”, Toric Geometry Seminar, UPenn, (02/10).
118. “Supersymmetry and Geometric Moduli Stabilization in Heterotic Vacua”, Univ. of Oxford, Mathematical Institute Seminar, (02/11)
119. “Supersymmetry and Geometric Moduli Stabilization in Heterotic Vacua”, Non-Kähler Geometry Meeting, Imperial College London, (02/11)
120. “Supersymmetry and Moduli Stabilization in Heterotic M-theory”, Columbia University, ISCAP Seminar, (01/11).
121. “Toric Geometry in String/M-theory”, Toric Geometry Seminar, UPenn. (11/10).
122. “Stabilizing the complex structure in Calabi-Yau compactifications of heterotic M-theory”, String Vacuum Project Meeting 2010, Ohio State University, (11/10).
123. “Supersymmetry and Moduli Stabilization in Heterotic theory”, U. Chicago, High Energy Theory Seminar, (11/10).
124. “Stabilizing the Complex Structure in Heterotic Calabi-Yau Vacua”, Rutgers University Theory Seminar, (10/10).
125. “Supersymmetry and Moduli Stabilization in Heterotic theory”, Duke University Math/Physics Seminar, (10/10).
126. “A new approach to moduli stabilization in Heterotic theories”, McGill University High Energy Theory seminar, (09/10).
127. “Numerical Algorithms: Metrics and Connections”, String Phenomenology 2010, Paris, France. (07/10).
128. “Consequences of Heterotic Supersymmetry”, AMS Meeting 2010, U. Kentucky, Lexington, KY, (03/10).
129. “Supersymmetry and Global Constraints in Heterotic Theories”, Strings at the LHC and in the Early Universe Program 2010, KITP, UC Santa Barbara, (03/10).
130. “Stability Walls and Heterotic Supersymmetry”, Physics Dept. Seminar, Virginia Tech, (02/10).
131. “Stability and Supersymmetry in Heterotic Theories”, Theory Seminar, Univ. of Ohio, (11/09).
132. “Stability and Supersymmetry in Heterotic Theories”, Workshop on $(0, 2)$ Mirror Symmetry, Max Planck Inst., Potsdam, Germany, (08/09).
133. “Stability Walls in Heterotic Theories: Part 1”, String Phenomenology 2009, Univ. of Warsaw, Poland (06/09).

134. “Stability Wall-Crossing in Heterotic Effective Theories”, Institute for Advanced Study, Princeton (04/09).
135. “Intro to F-Theory Phenomenology”, F-Theory Workshop, UPenn (11/08).
136. “An Algorithmic Approach to Heterotic Compactification”, talk given at “Mathematical Challenges in String Phenomenology” Workshop, ESI Vienna, (10/08).
137. “An Algorithmic Approach to Heterotic Compactification”, UPenn Math/Physics Seminar, (08/08).
138. “An Algorithmic Approach to Heterotic Compactification: Monads, CICYs, and Particle spectra”, DAMTP Cambridge seminar, (05/08).
139. “Monad bundles and heterotic strings”, Theory Seminar, University of Durham, IPPP, (11/07).
140. “An algorithmic approach to heterotic compactification”, Theory seminar, University of Liverpool, (10/07).
141. “An algorithmic approach to heterotic compactification”, String seminar, Princeton University, (09/07).
142. “M-theory on singular G_2 spaces”, Theor. Phys and Math. Seminar, Columbia University, (09/07).
143. “An algorithmic approach to heterotic compactification”, Duality Seminar, Harvard University, (09/07).
144. “String theory and the real world”, Physics Dept. Colloquium, Utah State University (09/07).
145. “M-theory on singular G_2 spaces”, String Seminar, Caltech, (09/07).
146. “M-theory on singular G_2 spaces”, Theor. Phys. Seminar, UC Santa Barbara, (09/07).
147. “M-theory on singular G_2 spaces”, Theor. Phys. Seminar, UC Berkeley, (09/07).
148. “An algorithmic approach to heterotic compactification”, Physics Dept. Seminar, Northeastern University, (09/07).
149. “An algorithmic approach to heterotic compactification”, Theory Seminar, University of Pennsylvania, (09/07).
150. “An algorithmic approach to heterotic compactification”, Perimeter Institute, (09/07).
151. “String Theory and the future”, Oxbridge Summer Program talk, Pembroke College, Oxford (07/07).
152. “M-Theory on singular G_2 spaces”, Theoretical Physics Seminar, University of Wales, Swansea (3/07).
153. “Monads on cyclic Calabi-Yau spaces”, Mathematical Physics Group Seminar, Mathematical Institute, University of Oxford (3/07).
154. “M-theory compactifications on G_2 Spaces” Particle Physics Seminar, Dept. of Physics, University of Oxford (10/06).
155. “M-Theory on the Orbifold C^2/Z_N ”, String Theory Seminar, Mathematical Institute, University of Oxford (4/06).
156. “A Review of M-theory on G_2 Spaces”. Mathematical Physics Group Seminar, Mathematical Institute, University of Oxford (4/06).
157. “Sharing the Mystery: Outreach Ideas in Advanced Physics”, Poster Presentation, World Conference on Physics and Sustainable Development, Durban, South Africa. (10/05).
158. “TOES, Strings and Magic: A Brief Overview of String and M-theory”, USU Physics Department Colloquium (8/05).
159. “A User’s Guide for the Universe”, Magdalen College, Oxford Research Forum (4/05).
160. “Biconformal Spaces and Supergravity”, talk at Oxford University Mathematical Institute. (11/04).

161. "A Look At Quantum Gravity", USU Physics Department Colloquium. (9/04).
162. "Posters on the Hill" Capitol Building Event, Salt Lake City, UT. Poster. "Biconformal Supergravity." (1/03).
163. Dirac Centennial Conference, Baylor University, Waco, Texas. Poster. "Biconformal Supergravity." (9/02).
164. USU Student Showcase, Poster Presentation. "Orthosymplectic Supergravity." (4/02).

References

1. Prof. Andre Lukas
Rudolf Peierls Centre for Theoretical Physics
University of Oxford
1 Keble Road,
Oxford, OX1 3NP, UK
Ph: (+44)(0)1865 273953
email: lukas@physics.ox.ac.uk
2. Prof. Washington Taylor
Center for Theoretical Physics
Massachusetts Institute of Technology
77 Massachusetts Avenue, Bldg. 6-317
Cambridge, MA 02139, USA
Ph: (+1)617 253 4827
email: wati@mit.edu
3. Prof. Burt Ovrut
Department of Physics and Astronomy
University of Pennsylvania
209 South 33rd Street
Philadelphia, PA, 19103, USA.
Ph: (+1)215 898 3594
email: ovrut@elcapitan.hep.upenn.edu
4. Prof. Shing-Tung Yau
Department of Mathematics
Harvard University
1 Oxford Street
Cambridge, MA, 02138, USA.
Ph: (+1) 617 495 0836
email: yau@math.harvard.edu