# CHARLES DORAN

## EDUCATION

**Harvard University, Mathematics, PhD Mathematics,** 1999
>   Advisors: Barry Mazur and Shing-Tung Yau.
>   Thesis: Picard-Fuchs Uniformization and Geometric Isomonodromic Deformations: Modularity and Variation of the
>   Mirror Map

**AM Mathematics,** 1993. **AB Mathematics,** 1992

## FACULTY POSITIONS

**University of Alberta, Mathematical and Statistical Sciences**
>   Full Professor with tenure, 2013-present. McCalla Professor of Science, 2013-2014
>   Associate Professor with tenure, 2008-2013

**University of Washington, Mathematics**
>   Affiliate Associate Professor, 2009-2011. Assistant Professor, 2003-2008

**University of Washington, Physics**
>   Adjunct Assistant Professor, 2006-2008

**Columbia University, Mathematics**
>   VIGRE/Ritt Assistant Professor, 2000-2004. Advisors: Brian Greene and John Morgan

**The Pennsylvania State University, Mathematics.**
>   S. Chowla Research Postdoctoral Fellow, 1999-2000. Advisor: Jean-Luc Brylinski

## VISITING & RESEARCH APPOINTMENTS

**Bard College, Mathematics Program**
>   Distinguished Visiting Professor of Mathematics and Physics, Jan. 2022-present

**Harvard University, Center of Mathematical Sciences and Applications (CMSA)**
>   Associate Member, Jul. 2019-present.  Visiting Scholar, Jul. 2018-Dec. 2018

**Brown University, Institute for Computational and Experimental Research in Mathematics (ICERM)**
>   Visiting Professor, 2017-2018

**University of Maryland, Department of Physics**
>   Visiting Campobassi Professor, 2015-2017

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## *INSTITUTIONAL GRANTS & COLLABORATIONS*

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**NSERC Collaborative and Thematic Resources Support in Mathematics and Statistics**
>   Co-PI on Pacific Institute for the Mathematical Sciences (PIMS) Grant, CAD $5,750,000 (2014-2019)

**PIMS Collaborative Research Grant (CRG) in Geometry and Physics** PI CAD $224,900 (2013-2016)

**National Science Foundation** US $100,000 (2014) To support US participation at the String-Math 2014 events in Canada

**Alberta Advanced Education and Technology** Co-PI on PIMS Grant, C$1,210,000 (2010-2014); C$1,200,000 (2014-2017)

**PIMS CRG in L-Functions and Number Theory** Co-PI, C$200,000 (2010-2013)

**NSERC Research Tools and Instruments Grant** C$23,630 (2010-2011)

**University of Alberta China Institute Special Faculty Initiative** CAD $5,000 (2010-2012)

## GRANTS FOR EDUCATIONAL INITIATIVES

**Natural Sciences and Engineering Research Council (NSERC) PromoScience Award:** C$117,200 from the Natural Sciences and Engineering Research Council (NSERC) to support the Critical Transitions for Inclusive Mathematics Enrichment program from 2021 to 2024.

**Teaching and Learning Enhancement Fund**: C$136,606 (2013-2016) to enhance mathematics education through innovative teaching

methods.

**Alberta Summer Mathematics Institute**: Secured funding over C$200,000 from the Government of Alberta and the University of Alberta (2010-2016) to establish and sustain ASMI to support graduate students and postdoctoral fellows in program for high school students.

## INDIVIDUAL RESEARCH FUNDING & AWARDS

**NSERC Discovery Grant:** C$390,000 (2010-2022)
**Institut Henri Poincaré Grant: €7,000 (2019)** for math/physics international research collaboration with Pierre Vanhove
**Mathematical Association of America Merton M. Hasse Prize:** US $1,000 (2015), with Ursula Whitcher.
**NSERC-Subatomic Physics, Individual Discovery Grant:** C$25,000 (2009-2010)
**National Science Foundation (NSF) SCREMS Grant:** Secured US$106,869 in collaboration with William Stein as Co-PI (2008-2011)

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## *LEADERSHIP POSITIONS*

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## FOUNDER & DIRECTOR

**Bard Interdisciplinary Science Postbaccalaureate Research Accelerator (BISPRA)** (2023-present)

Founding new program to increase the number of undergraduates with a liberal arts background entering graduate studies in Mathematics and Science. This transformational research experience aims to make these students competitive with research focused institutions by funding an additional year of research and mentoring. Continuing my commitment to advance equity in STEM, this inclusive initiative will focus on groups underrepresented in the sciences.  To sustain and grow the program's research, I continue to cultivate relationships with private donors.

**Diversity in Research Experiences Across Mathematics (DREAMs)** (2023)

DREAMs aims at the junction between high school and university for highly motivated, talented underrepresented students with demonstrated interest in mathematics.  The overarching mission of DREAMs is to give these students experience with mathematical research and inspire postsecondary studies and careers in mathematical disciplines or related STEM fields. This three-week program is comprised of lectures in topics such as paradoxes in special relativity and exploring the topology of higher-dimensional surfaces. Interactive activities, mentoring sessions, and a capstone student research project on topics from linear algebra to topology provide meaningful exposure to university-level mathematics. The DREAMs program was established through generous funding from the PromoScience grant for advancing mathematics education during critical transitional periods.

**Alberta Summer Mathematics Institute (ASMI)** (2009-2016)

Founded and directed ASMI, a summer enrichment program for high school students from grades 10 to 12. My vision was to introduce mathematical exploration and research in an inclusive, tuition-free environment. For four weeks each summer, ASMI was hosted at the University of Alberta campus. Students were mentored by eminent guest lecturers from leading international institutions and gained firsthand experience through their own research projects. Under my leadership, ASMI quickly became a launching pad for budding research mathematicians, providing them with this formative opportunity early in their academic journeys. The program also funded postdoctoral and graduate students to serve as advisors (and some becoming co-directors), supporting their professional development.

## OTHER LEADERSHIP POSITIONS

**University of Alberta, Faculty of Science**

Lead for Algebra, Geometry, and Applications (AGA) research and teaching area 2017-2022
Member of Theoretical Physics Institute, 2010-present
**Pacific Institute for the Mathematical Sciences (PIMS)**
University of Alberta PIMS Site Director, 2009-2012, 2012-2015

**University of British Columbia**

Member of the Pacific Institute of Theoretical Physics, 2003-2008
**University of Alberta**
Appointments Subcommittee for Mathematical Physics: Recruited David Favero, 2013. Recruited Vincent Bouchard, 2009
**Canadian Mathematical Society (CMS)**
Member of CMS Research Committee, 2011-2014

## CONFERENCE AND SEMINARS

**Harvard University, Center of Mathematical Sciences and Applications (CMSA)**
Co-organizer, Algebraic Geometry in String Theory Seminar, 2021-present
**PIMS**
Co-organizer, Hodge Theory, Mirror Symmetry, and Physics of Calabi-Yau Moduli, 2023
**Mainz Institute for Theoretical Physics (MITP)**
Co-organizer, Spectral Theory, Algebraic Geometry, and Strings, 2023
**Zoom Algebraic Geometry Seminar (ZAG)**
Co-organizer for new international online research seminar, active during pandemic, 2020-2022
**Isaac Newton Institute for Mathematical Sciences**
Co-organizer: K-theory, Algebraic Cycles, and Motivic Homotopy Theory, January-June 2020
**String-Math 2014 Conference, University of Alberta**
Lead conference organizer for premier international conference in String Theory and Mathematics
**Canadian Western Algebraic Geometry Symposium**
Co-organizer and co-founder, 2017 (Alberta), 2020 (Saskatchewan), 2023 (British Columbia)
**Fields Institute, Toronto**
Organizer, Calabi-Yau Varieties: Arithmetic, Geometry and Physics, 2013 and Arithmetic and Geometry of K3 Surfaces and Calabi- Yau Threefolds, 2011
**Tsinghua Sanya International Mathematics Forum (TSIMF)**
Represented PIMS and BIRS at TSIMF Inauguration Conference in Sanya, China, 2010

## EDITORIAL AND REVIEW ROLES

**Cambridge University Press, Experimental Results**
Chief Editor for Mathematics, Statistics, & Probability journal, 2019-2023
**Advances in Theoretical and Mathematical Physics (ATMP)**
Editor and Managing Editor, 2004-present

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## *TEACHING AND MENTORING*

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## POSTDOCTORAL MENTORING

**Mohsen Karkheiran.** Current fellow. U. Alberta
**Jesse Huang.** 2021-2022. U. Alberta with David Favero
**Fenglong You.** 2017-2020. U. Alberta with David Favero and Vincent Bouchard
**Andrey Novoseltsev.** 2011-2016. U. Alberta
**D. Peter Overholser.** 2014. U. Alberta, with Emanuel Diaconescu
**Alan Thompson.** 2011-2014. U. Alberta
**Stefan Méndez-Diez.** 2010-2014. U. Alberta with Vincent Bouchard
**Christopher Marks.** 2010-2013. U. Alberta with Terry Gannon
**Richard Garavuso.** 2009-2012. U. Alberta
**Francois-Xavier Machu.** 2009-2011. U. Alberta
**Aravind Asok.** 2005-2008, U. Washington

**Christopher Herzog.** 2005-2007. U. Washington: Physics with Matthew Strassler

## PHD STUDENT SUPERVISION

**Minako Chinen.** Current PhD student, U. Alberta
**Eric Pichon-Pharabod.** Current PhD student with Pierre Lairez (Université Paris-Saclay) and Pierre Vanhove
**Joseph Prebble.** Current PhD student with Alan Thompson (U. of Loughborough)
**Soumya Sinha Babu.** PhD 2022 with Matt Kerr (Washington U.) "Quantum Curves and asymptotic Hodge Theory"
**Jordan Kostiuk.** PhD 2018. U. Alberta "Geometric Variations of Local Systems"
**Andrew Harder**. PhD 2016. U. Alberta "The Geometry of Landau-Ginzburg Models"
**Andrey Novoseltsev.** PhD 2011. U. Alberta "Calabi-Yau Hypersurfaces and Complete Intersections in Toric Varieties"
**Jacob Lewis**. PhD 2010. U. Washington "Elliptic and K3 Surfaces: Normal Forms, Deformations, and Applications"
**Robert Miller**. PhD 2010. U. Washington with William Stein "Empirical Evidence for the Birch and Swinnerton-Dyer Conjecture"
**Ursula Whitcher.** PhD 2009. U. Washington "Polarized Families of K3 Surfaces"
**Simon Judes.** PhD 2008, with Brian Greene (Columbia University, Physics) "Topics in String Theory and Cosmology"
**Joshua Kantor.** PhD 2008. U. Washington, with Robin Graham (U. Washington) "Eleven-Dimensional Supergravity on Edge Manifolds"
**Matthew Ballard.** PhD 2008. U. Washington "Derived Categories of Sheaves of Quasi-Projective Schemes"
**Brandon Bates.** PhD 2006. Brian Greene (Columbia University, Physics) "Studies in Quantum Geometry"

## MSC STUDENT SUPERVISION

**Minako Chinen.** MSc 2018. U. Alberta "A Geometric and Graphical Study of 1-Dimensional N-Extended Supersymmetry Algebras"
**Jordan Kostiuk.** MSc 2013. U. Alberta "Heegner Points, Hilbert's Twelfth Problem, and the Birch and Swinnerton-Dyer Conjecture"
**Jason Wilkes.** MSc 2011. U. Alberta with Eric Woolgar "Numerical Simulation of Ricci Flow on a Class of Manifolds with Non-Essential Minimal Surfaces"

## UNDERGRADUATE STUDENT ADVISING

**Santanu Antu.** Bard College, with Hal Haggard (Bard College) "Tetrahedral Moduli and Elliptic Curves"
**Caden Kundlas.** U. Alberta "Solving the Recognition Problem for K-equations"
**Nathaniel Bartolome, Breanna Fang, and Amrit Klair.** U. Alberta "The Mathematics of Supersymmetry"
**James Iverson.** U. Alberta "From Adinkras to Dessins: Supersymmetric Surface Codes"
**Ethan Ross.** U. Alberta "Algebraic Geometric and Topological Codes from Supersymmetry"
**Jordan Kostiuk.** U. Alberta "Elliptic Curves and the Birch and Swinnerton-Dyer Conjecture" (PhD, U. Alberta 2018)
**Yuri (Delanghe) Sulyma.** U. Alberta "Computational Toric Geometry" and "Intersection Cohomology and Newton-Okounkov Bodies" (PhD, U. Texas at Austin, 2019)
**Josh Shadlen**. U. Washington "Hodge Theory of Calabi-Yau Hypersurfaces" (PhD, Northwestern U., 2015)
**Jacob Lewis**. Columbia University "Geodesics Using Mathematica" (PhD, U. Washington, 2010)
**Noah Giansiracusa**. U. Washington "Cubic Surfaces and their Moduli" (PhD, Brown U., 2011)
**Spencer Greenberg**. Columbia University: Department of Applied Mathematics "Level Sets of Arbitrary Dimension Polynomials with Positive Coefficients and Real Powers" (PhD, New York University, 2016)
**Christopher Miller**. Columbia University, Physics "The Proof of the Positive Mass Conjecture and its Implications in General Relativity" (PhD, Columbia University, 2008)
**David Kagan**. Columbia University, Physics with Michael Faux "Anomaly Cancellation in K3 Orbifolds of M-Theory" (PhD, University of Cambridge, 2007)

## SELECTED COURSES

**Selected Short Courses:**
Calabi-Yau Fibrations and Degeneration, Aug. 2022, Bhaskaracharya Pratishthana, Pune Trimester on Calabi-Yau 3-Folds
Geometry and Moduli of K3 Surfaces, Sep. 2021, Siberian Summer School: Current Developments in Geometry
Picard-Fuchs Differential Equations, Oct.-Dec. 2020, Mathematical Sciences Research Institute, Berkeley
Calabi-Yau Manifolds, Mirrors, and Motives, January 2020, Isaac Newton Institute, Cambridge

Calabi-Yau Manifolds, Mirrors, and Moduli, October 2017, Albert-Ludwigs Universität Freiburg
Lectures on K3 Surfaces, September 2011, Institute of Math. Sciences, Chinese University of Hong Kong
Periods, Picard-Fuchs Equations, and Calabi-Yau Moduli, August 2011, Fields Institute, Toronto
Mirror Symmetry and Algebraic Cycles, June 2009, Leibniz Universität Hannover

**Selected Graduate Courses:**

Differential Equations in Algebraic Geometry, Complex Variables, Calabi-Yau Geometry, Computation in Mathematics: Research via Experimentation, Geometry and Modular Forms, Differentiable Manifolds, Curves and Bundles, Calabi-Yau Manifolds, Elliptic Curves and Elliptic Fibrations, Mirror Symmetry, Exceptional Structures in Mathematics, Hodge Theory, Automorphic Forms in Geometry and Physics, Deformation Theories for Geometry and Number Theory

**Selected Undergraduate Courses:**

Mathematical Methods of Physics, Introduction to Partial Differential Equations, Theory of Functions of a Complex Variable, Geometry, Coding Theory, Differential Equations, Calculus with Analytical Geometry, Introductory Calculus, Fourier Analysis, Differential Geometry, Introduction to Analysis, Linear Algebra, Vector Calculus, Mathematics for the Public Good, Algebraic Curves

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*PUBLICATIONS*

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**Publications on arXiv:**

   i.   **Towards the Doran-Harder-Thompson Conjecture via the Gross-Siebert Program**
        Lawrence J. Barrott, Charles Doran, arXiv:2105.02617v1 [math.AG] 6 May 2021: 31 pages
  ii.   **Degenerations, Fibrations, and Higher Rank Landau-Ginzburg Models**
        Charles Doran, Jordan Kostiuk, and Fenglong You, arXiv:2112.12891v1 [math.AG] 24 Dec 2021: 41 pages
 iii.   **The Mirror Clemens-Schmid Sequence**
        Charles Doran and Alan Thompson, arXiv:2109.04849v2 [math.AG] 13 May 2022: 28 pages
  iv.   **The Motivic Geometry of Two-Loop Feynman Integrals**
        Charles Doran, Andrew Harder, Pierre Vanhove (with an appendix by Eric Pichon-Pharabod), arXiv:2302.14840 [math.AG] 28 Feb 2023: 67 pages
   v.   **Modularity of Landau-Ginzburg Models**
        Charles Doran, Andrew Harder, Ludmil Katzarkov, Mikhail Ovcharenko, Victor Przyjalkowski, arXiv:2307.15607 [math.AG] 28 Jul 2023: 252 pages
  vi.   **Normal Forms and Tyurin Degenerations of K3 Surfaces Polarized by a Rank 18 Lattice**
        Charles Doran, Joseph Prebble, Alan Thompson, arXiv:2311.10394 [math.AG] 17 Nov 2023: 24 pages

**Refereed Publications:**

1.   **The Motivic Geometry of Two-Loop Feynman Integrals**
     Charles Doran, Andrew Harder, Pierre Vanhove (with an appendix by Eric Pichon-Pharabod), to appear in The Quarterly Journal of Mathematics, Oxford University Press: 67 pages

2.   **K2 and Quantum Curves**
     Charles Doran, Matt Kerr, Soumya Sinha Babu.  To appear in Advances in Theoretical and Mathematical Physics (2023): 51 pages

3.   **Geometric Variations of Local Systems and Elliptic Surfaces**
     Charles Doran and Jordan Kostiuk. Israel Journal of Mathematics (2023): 79 pages

4.   **The Doran-Harder-Thompson Conjecture for Toric Complete Intersections**

Charles Doran, Jordan Kostiuk, Fenglong You. Advances in Mathematics, Volume 415 (2023), 108893 : 47 pages

5.  **Unwinding Toric Degenerations and Mirror Symmetry for Grassmannians**
    Tom Coates, Charles Doran, Alana Kalashnikov. Forum of Mathematics, Sigma, Volume 10 (2022), e111: 33 pages

6.  **Hypergeometric Decomposition of Symmetric K3 Quartic Pencils**
    Charles Doran, Tyler Kelly, Adriana Salerno, Steven Sperber, John Voight, Ursula Whitcher. Research in the Mathematical Sciences 7, Article number: 7 (2020): 81 pages

7.  **Calabi-Yau Threefolds Fibred by High Rank Lattice Polarized K3 Surfaces**
    Charles Doran, Andrew Harder, Andrey Novoseltsev, Alan Thompson. Mathematische Zeitschrift (2020) 294: 783-815

8.  **Calabi-Yau Manifolds Realizing Symplectically Rigid Monodromy Tuples.**
    Charles Doran and Andreas Malmendier. Advances in Theoretical and Mathematical Physics, Volume 23 (2019) Issue 5, 1271-1359

9.  **Specialization of Cycles and the K-Theory Elevator**
    Pedro Luis del Angel, Charles Doran, Matt Kerr, James Lewis, Jaya Iyer, Stefan Müller-Stach, Deepam Patel Communications in Number Theory and Physics, Volume 13 (2019) Number 2, 299-349

10. **Mirror Symmetry for Lattice Polarized Del Pezzo Surfaces**
    Charles Doran, Alan Thompson. Communications in Number Theory and Physics, Volume 12, Number 3 (2018), 543-580

11. **Zeta Functions of Alternate Mirror Calabi-Yau Families**
    Charles Doran, Tyler Kelly, Adriana Salerno, Steven Sperber, John Voight, Ursula Whitcher. Israel Journal of Mathematics, October 2018, Volume 228, Issue 2, 665-705

12. **Geometrization of N-Extended 1-Dimensional Supersymmetry Algebras, II**
    Charles Doran, Kevin Iga, Jordan Kostiuk, Stefan Méndez-Diez. Advances in Theoretical and Mathematical Physics, Volume 22, Issue 3 (2018).

13. **Equivalences of Families of Stacky Toric Calabi-Yau Hypersurfaces.**
    Charles Doran, David Favero, Tyler Kelly. Proceedings of the American Mathematical Society, 146 (2018), 4633-4647

14. **Picard-Fuchs Uniformization of Modular Subvarieties**
    Brent Doran, Charles Doran, Andrew Harder; 2018; In *Uniformization, Riemann-Hilbert Correspondence, Calabi- Yau Manifolds, and Picard-Fuchs Equations*. Eds. Lizhen Ji and Shing-Tung Yau. International Press/Higher Education Press. Advanced Lectures in Mathematics, Volume 42, 21-54

15. **Innovative CAS Technology Use in University Mathematics Teaching and Assessment: Findings from a Case Study in Alberta, Canada**
    Daniel Jarvis, Chantal Buteau, Charles Doran, Andrey Novoseltsev; 2018; Journal of Computers in Mathematics and Science Teaching, 37(4). 34 pages

16. **Hodge Numbers from Picard-Fuchs Equations**
    Charles Doran, Andrew Harder, Alan Thompson; 2017; SIGMA 13 (2017), 045, 23 pages

17. **Off-shell Supersymmetry and Filtered Clifford Supermodules**
    Charles Doran, Michael Faux, Jim Gates, Tristan Hübsch, Kevin Iga, Greg Landweber; 2017; Algebras and Representation Theory, DOI: 101007/s10468-017-9718-8, July 2017

18. **Vertical D4-D2-D0 Bound States on K3 Fibrations and Modularity**

Vincent Bouchard, Thomas Creutzig, Duiliu-Emanuel Diaconescu, Charles Doran, Callum Quigley, Artan Sheshmani; 2017; Communications in Mathematical Physics 350, 1069-1121 (2017)

**19. Mirror Symmetry, Tyurin Degenerations, and Fibrations on Calabi-Yau Manifolds**

Charles Doran, Andrew Harder, Alan Thompson; 2018; In *String-Math 2015,* American Mathematical Society, Proceedings of Symposia in Pure Mathematics, 96, 93-132

**20. Special Function Identities from Superelliptic Kummer Varieties**

Adrian Clingher, Charles Doran, Andreas Malmendier; 2017; Asian Journal of Mathematics, Volume 21 (2017) Number 5, 909-952

**21. An Application of Cubical Cohomology to Adinkras and Supersymmetry Representations**

Charles Doran, Kevin Iga, Greg Landweber; 2017; Annales de l'Institut Henri Poincaré D: Combinatorics, Physics and their Interactions, Volume 4, Issue 3, 2017, 387-415

**22. Calabi-Yau Threefolds Fibred by Mirror Quartic K3 Surfaces**

Charles Doran, Andrew Harder, Andrey Novoseltsev, Alan Thompson; 2016; Advances in Mathematics, Volume 298, 6 August 2016, 369-392

**23. Toric Degenerations and Laurent Polynomials Related to Givental's Landau-Ginzburg Models**

Charles Doran, Andrew Harder; 2016; Canadian Journal of Mathematics, Volume 68 (2016), 784-815

**24. Calabi-Yau Threefolds Fibred by Kummer Surfaces Associated to Products of Elliptic Curves**

Charles Doran, Andrew Harder, Andrey Novoseltsev, Alan Thompson; 2016; In *String-Math 2014,* American Mathematical Society, Proceedings of Symposia in Pure Mathematics 93, 278-303

**25. Humbert Surfaces and the Moduli of Lattice Polarized K3 Surfaces**

Charles Doran, Andrew Harder, Hossein Movasati, Ursula Whitcher; 2016; In *String-Math 2014*, American Mathematical Society, Proceedings of Symposia in Pure Mathematics 93, 124-155

**26. The 14th Case VHS via K3 Fibrations**

Adrian Clingher, Charles Doran, Jacob Lewis, Andrey Novoseltsev, Alan Thompson; 2016; In *Recent Advances in Hodge Theory: Period Domains, Algebraic Cycles, and Arithmetic*, Cambridge University Press, London Mathematical Society Lecture Note Series 427, 165-227

**27. Geometrization of N-Extended 1-Dimensional Supersymmetry Algebras, I**

Charles Doran, Kevin Iga, Jordan Kostiuk, Greg Landweber, Stefan Méndez-Diez; 2015; Advances in Theoretical and Mathematical Physics, Volume 19 (2015) Number 5, pp 1043-1113

**28. Families of Lattice Polarized K3 Surfaces with Monodromy**

Charles Doran, Andrew Harder, Andrey Novoseltsev, Alan Thompson; 2015; International Mathematics Research Notices, 2015 (23): 12265-12318

**29. String Theory on Elliptic Curve Orientifolds and KR-Theory**

Charles Doran, Stefan Méndez-Diez, Jonathan Rosenberg; 2014; Communications in Mathematical Physics, April 2015, Volume 335, Issue 2, pp. 955-1001

**30. Algebraic Cycles and Local Quantum Cohomology**

Charles Doran, Matt Kerr; 2014; Communications in Number Theory and Physics, Volume 8 (2014), Number 4, pp. 703-727

**31. Normal Functions, Picard-Fuchs Equations, and Elliptic Fibrations on K3 Surfaces**

Xi Chen, Charles Doran, Matt Kerr, James Lewis ; 2014 ; Journal für die reine und angewandte Mathematik (Crelles Journal), DOI: 10.1515/crelle-2014-0085, November 2014

**32. T-Duality for Orientifolds and Twisted KR-Theory**

Charles Doran, Stefan Méndez-Diez, Jonathan Rosenberg; 2014; Letters in Mathematical Physics; November 2014, Volume 104, Issue 11, pp. 1333-1364

**33. Short Tops and Semistable Degenerations**

Ryan Davis, Charles Doran, Adam Gewiss, Andrey Novoseltsev, Dmitri Skjorshammer, Alexa Syryczuk, Ursula Whitcher; 2014; Experimental Mathematics, Volume 23, Issue 4, 2014, pp. 351-362

**34. On General Off-Shell Representations of Worldline (1D) Supersymmetry**

Charles Doran, Tristan Hübsch, Kevin Iga, Gregory Landweber; 2014; Symmetry, 2014, 6(1), pp. 67-88

**35. Automorphic Forms for Triangle Groups**

Charles Doran, Terry Gannon, Hossein Movasati, Khosro Shokri; 2013; Communications in Number Theory and Physics, Volume 7 (2013), Number 4, pp. 689-737

**36. From Polygons to String Theory**

Charles Doran, Ursula Whitcher; 2012; Mathematics Magazine, Vol 85, Number 5, December 2012, 343-360

**37. Lattice Polarized K3 Surfaces and Siegel Modular Forms**

Adrian Clingher, Charles Doran; 2012; Advances in Mathematics, Volume 231, Issue 1, 172–212

**38. Codes and Supersymmetry in One Dimension**

Charles Doran, Michael Faux, Jim Gates, Tristan Hübsch, Kevin Iga, Greg Landweber, Robert Miller; 2011; Advances in Theoretical and Mathematical Physics, Volume 15, Number 6 (2011), 1909-1970

**39. Hori-Vafa Mirror Periods, Picard-Fuchs Equations, and Berglund-Hübsch-Krawitz Duality**

Charles Doran, Richard Garavuso; 2011; Journal of High Energy Physics, October 2011, 2011:128

**40. Algebraic K-Theory of Toric Hypersurfaces**

Charles Doran, Matthew Kerr; 2011; Commun. Number Theory Phys, Vol 5, No 2, pp. 397-600

**41. Note on a Geometric Isogeny of K3 Surfaces**

Adrian Clingher, Charles Doran; 2011; International Mathematics Research Notices, 2011 (16): 3657-3687

**42. Closed Form Expressions for Hodge Numbers of Complete Intersection Calabi-Yau Threefolds in Toric Varieties**

Charles Doran, Andrey Novoseltsev; 2010; In *Mirror Symmetry and Tropical Geometry*, Contemporary Mathematics, Vol 527, pp. 1-14

**43. A Superfield for Every Dash-Chromotopology**

Charles Doran, Michael Faux, Jim Gates, Tristan Hübsch, Kevin Iga, Greg Landweber; 2009; International Journal of Modern Physics A, Vol 24, Issue 30, pp. 5681-5695

**44. Frames for Supersymmetry**

Charles Doran, Michael Faux, Jim Gates, Tristan Hübsch, Kevin Iga, Greg Landweber; 2009; International Journal of Modern Physics A, Vol 24, Issue 14 (2009) pp. 2665-2676

**45. Normal Forms, K3 Surface Moduli, and Modular Parametrizations**

Adrian Clingher, Charles Doran, Jacob Lewis, Ursula Whitcher; 2009; In *Groups and Symmetries*, CRM Proceedings and Lecture Notes, 47, 81-98

**46. Super-Zeeman Embedding Models on N-Supersymmetric World-Lines**

Charles Doran, Michael Faux, Jim Gates, Tristan Hübsch, Kevin Iga, Greg Landweber; 2009; Journal of Physics A: Mathematical and Theoretical, Vol 42. 065402

**47. On the Matter of $N$ = 2 Matter**

Charles Doran, Michael Faux, Jim Gates, Tristan Hübsch, Kevin Iga, Greg Landweber; 2008; Physics Letters B, Volume 659, Issues 1-2, 17, Pages 441-446

**48. Numerical Kähler-Einstein Metric on the Third del Pezzo**

Charles Doran, Matthew Headrick, Christopher Herzog, Joshua Kantor, Toby Wiseman; 2008; Communications in Mathematical Physics, Volume 282, Number 2, 357-393

**49. Families of Quintic Calabi-Yau 3-Folds with Discrete Symmetries**

Charles Doran, Brian Greene, Simon Judes; 2008; Communications in Mathematical Physics, Volume 280, Number 2, 675-725

**50. Counterexamples to a Putative Classification of 1-Dimensional, N-extended Supermultiplets**

Charles Doran, Michael Faux, Jim Gates, Tristan Hübsch, Kevin Iga, Greg Landweber; 2007; Advanced Studies in Theoretical Physics, Vol 2, no 3, 99 – 111

**51. Adinkras and the Dynamics of Superspace Prepotentials**

Charles Doran, Michael Faux, Jim Gates, Tristan Hübsch, Kevin Iga, Greg Landweber; 2008; Advanced Studies in Theoretical Physics, Vol 2, no 3, 113 – 164

**52. On Stokes Matrices of Calabi-Yau Hypersurfaces**

Charles Doran, Shinobu Hosono; 2007; Advances in Theoretical and Mathematical Physics, Volume 11, Issue 1, 147-174

**53. Algebraic Topology of Calabi-Yau Threefolds in Toric Varieties**

Charles Doran, John Morgan; 2007; Geometry and Topology, 11, 597-642

**54. Crosscaps in Gepner Models and the Moduli Space of T2 Orientifolds**

Brandon Bates, Charles Doran, Koenraad Schalm; 2007; Advances in Theoretical and Mathematical Physics, Volume 11, Issue 5, 839-912

**55. Modular Invariants for Lattice Polarized K3 Surfaces**

Adrian Clingher, Charles Doran; 2007; Michigan Mathematical Journal, 55, Issue 2, 355-393

**56. On Graph-Theoretic Identifications of Adinkras, Supersymmetry Representations and Superfields**

Charles Doran, Michael Faux, Jim Gates, Tristan Hübsch, Kevin Iga, Greg Landweber; 2007; International Journal of Modern Physics A, Vol 22, No 5, 869-930

**57. On K3 Surfaces with Large Complex Structure**

Adrian Clingher, Charles Doran; 2007; Advances in Mathematics, 215, 504-539

**58. Mirror Symmetry and Integral Variations of Hodge Structure Underlying One Parameter Families of Calabi-Yau Threefolds**

Charles Doran, John Morgan; 2006; In *Mirror Symmetry V*, AMS/IP Studies in Advanced Mathematics, 38, 517-537

**59. A "Periodic Table" for Supersymmetric M-Theory Compactifications**

Charles Doran, Michael Faux; 2003; Journal of Mathematical Physics, 44, 2853-2873

60. **Four-Dimensional N = 1 Super Yang-Mills Theory from an M-Theory Orbifold**
Charles Doran, Michael Faux, Burt Ovrut; 2002 ; Advances in Theoretical and Math Phys, 6, 329-355

61. **Intersecting Branes in M-Theory and Chiral Matter in Four Dimensions**
Charles Doran, Michael Faux; 2002; Journal of High Energy Physics, JHEP08, 024

62. **Algebraic and Geometric Isomonodromic Deformations**
Charles Doran; 2001; Journal of Differential Geometry, 59, 33-85

63. **Algebro-geometric Isomonodromic Deformations Linking Hauptmoduls: Variation of the Mirror Map**
Charles Doran; 2001; Centre de Recherches Mathematiques: In *Proceedings on Moonshine and Related Topics*, CRM Proceedings and Lecture Notes, 30, 27-35

64. **Picard-Fuchs Uniformization and Modularity of the Mirror Map**
Charles Doran; 2000; Communications in Mathematical Physics, 212, 625-647

65. **Picard-Fuchs Uniformization: Modularity of the Mirror Map and Mirror-Moonshine**
Charles Doran; 2000; In *the Arithmetic and Geometry of Algebraic Cycles*, CRM Proceedings and Lecture Notes, 24, 257-281

**Books and Book Chapters:**

66. **CAS Use in University Mathematics Teaching and Assessment: Applying Oates' Taxonomy for Integrated Technology**
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67. **Superschool on Derived Categories and D-branes**
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68. **String-Math 2014**
Vincent Bouchard, Charles Doran, Stefan Méndez-Diez, Callum Quigley, Eds.; 2016; American Mathematical Society, Proceedings of Symposia in Pure Mathematics 93, 396 pages.

69. **Yau's Work on Moduli, Periods, and Mirror Maps for Calabi-Yau Manifolds**
Charles Doran; 2010; In "Geometry and Analysis," Volume I. Pages 93-10

70. **Modular Forms and String Duality**
Noriko Yui, Helena Verrill, Charles Doran, Eds; 2008; Fields Institute Communications, 54,297 pages

**In Preparation:**

71. **Deformation Theory: An Historical Annotated Bibliography**
Charles Doran. 30 pages. Chapter written for an unpublished book on Galois deformation theory, with Siman Wong, based on our notes from a course by Barry Mazur

72. **An Introduction to Supersymmetry Using Adinkras**
Charles Doran, Michael Faux, Tristan Hübsch, Kevin Iga, Ursula Whitcher. Book in preparation. 557 pages