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CURRICULUM VITAE

July 28, 2022

Education:

2007 – 2012 **Ph.D. in Mathematics**, Columbia University
Supervisor: Professor Duong H. Phong
Thesis: *Limiting properties of certain geometric flows in complex geometry.*

2003 – 2007 **B.A. in Mathematics**, University of California Berkeley

Employment:

2019 – Present **Associate Professor,** University of California Davis

2015 – 2019 **Assistant Professor,** University of California Davis

2012 – 2015 **NSF Postdoctoral Fellow,** Harvard University
Mentor: Professor Shing-Tung Yau

Academic Honors and Grants:

2020 ICCM Best Paper Award, Gold Medal, for the paper *(1, 1) forms with specified Lagrangian phase: A priori estimates and algebraic obstructions*, joint with T.C. Collins and S.-T. Yau.

Simons Collaboration Grant, 2018-2023.

2017 UC Davis Hellman Fellow.

NSF Postdoctoral Fellowship DMS-1204155, 2012-2015.

Thesis awarded with distinction, Columbia University, 2012.

Research Interests:

Differential Geometry, Complex Analysis, and Partial Differential Equations.

Preprints:

3. *The Deformed Hermitian-Yang-Mills Equation and Level Sets of Harmonic Polynomials*, arXiv:2204.01875.

2. *The SYZ mirror symmetry conjecture for del Pezzo surfaces and rational elliptic surfaces* (with T.C. Collins and Y.-S. Lin), arXiv:2012.05416.

1. *The deformed Hermitian-Yang-Mills equation on the blowup of* $\mathbb{P}^n$ (with N. Sheu), arXiv:2009.00651.

Publications:

20. *The Torelli Theorem for ALH* Gravitational Instantons* (with T.C. Collins and Y.-S. Lin), Forum Math. Sigma (to appear).

19. *Hermitian Yang-Mills connections on collapsing elliptically fibered K3 surfaces* (with V. Datar), J. Geom. Anal. 32 (2022), no. 2, Paper No. 69, 30pp.

18. *Special Lagrangian submanifolds of log Calabi-Yau manifolds* (with T.C. Collins and Y.-S. Lin), Duke Math. J. 170 (2021), no. 7. 1291-1375.

17. *Adiabatic limits of anti-self-dual connections on collapsed K3 surfaces* (with V. Datar and Y. Zhang), J. Differential Geom. 118 (2021), no. 2, 223-296.

16. *Weak Geodesics for the deformed Hermitian-Yang-Mills equation*, Pure Appl. Math. Q. 17 (2021), no. 3, 1113-1137.

15. $(1,1)$ *forms with specified Lagrangian phase: A priori estimates and algebraic obstructions* (with T.C. Collins and S.-T. Yau), Camb. J. Math. 8 (2020), no. 2, 407-452.

14. *Poisson metrics on flat vector bundles over non-compact curves* (with T.C. Collins and S.-T. Yau), Comm. Anal. Geom. 27 (2019), no. 3, 529-597.

13. *Hermitian Yang-Mills metrics on reflexive sheaves over asymptotically cylindrical Kähler manifolds* (with T. Walpuski), Comm. Partial Differential Equations, 43 (2018), no. 11, 1566-1598.

12. *Tangent cones of Hermitian Yang-Mills connections with isolated singularities* (with H. Sá Earp and T. Walpuski), Math. Res. Lett. 25 (2018), no. 5, 1429-1445.

11. *A special Lagrangian type equation for holomorphic line bundles* (with S.-T. Yau), Math. Ann. 369 (2017), no. 1-2, 869-898.

10. *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds,* Amer. J. Math. 138 (2016), no. 2, 329-365.

9. *The limit of the Yang-Mills flow on semi-stable bundles,* J. Reine Angew. Math. 709 (2015), 1-13.

8. *Stable Higgs bundles and Hermitian-Einstein metrics on non-Kähler manifolds,* Contemp. Math. 644 (2015), 117-140.

7. *On the convergence of the Sasaki-Ricci flow* (with T.C. Collins), Contemp. Math. 644 (2015), 11-22.

6. *Existence of approximate Hermitain-Einstein structures on semi-stable bundles,* Asian J. Math. 18 (2014), No. 5, 859-884.

5. *Automorphisms and connections on Higgs bundles over compact Kähler manifolds* (with I. Biswas, S. Bradlow and M. Stemmler), Differential Geom. Appl. 32 (2014), 139-152.

4. *Remarks on the Yang-Mills flow on a compact Kähler manifolds* (with T.C. Collins), Univ. Iagel. Acta Math. No. 51 (2013), 17-43.

3. *Approximate Hermitian-Einstein connections on principal bundles over a compact Riemann surface* (with I. Biswas, S. Bradlow and M. Stemmler), Ann. Global Anal. Geom. 44 (2013), no. 3, 257-268.

2. *Existence of approximate Hermitian-Einstein structures on semistable principal bundles* (with I. Biswas and M. Stemmler), Bull. Sci. Math. 136 (2012), no. 7, 745-751.

1. *The isoperimetric problem on planes with density* (with C. Carroll, C. Quinn and R. Walters), Bull. Austral. Math. Soc. 78 (2008), 177-197.

Invited Lectures and Talks:

Grenoble Summer School in Mathematics, Non-Abelian Hodge Theory (June 2022) *From Higgs bundles to local systems.*

SISSA/ICTP Trieste, Kähler Geometry Seminar (May 2022), *The deformed Hermitian-Yang-Mills equation and Calabi Symmetry.*

American Institute of Mathematics, Workshop on Stability in mirror symmetry (April 2022), *The deformed Hermitian-Yang-Mills equation and level sets of harmonic polynomials.*

University of Waterloo, Geometry & Topology Seminar (March 2022), *The deformed Hermitian-Yang-Mills equation.*

Université du Québec à Montréal, Topology and Geometry seminar (December 2021), *Special Lagrangian torus fibrations on Del Pezzo and Rational Elliptic Surfaces.*

Stanford University, Geometry Seminar (March 2021), *SYZ Mirror Symmetry for Del Pezzo and Rational Elliptic Surfaces.*

American Institute of Mathematics, Workshop on Stability in mirror symmetry (December 2020), *The deformed Hermitian-Yang-Mills equation.*

SIAM Conference, mini symposium on gauge theory and partial differential equations (December 2019), *Adiabatic limits of Yang-Mills connections on collapsing K3 surfaces.*

University of California Davis, PDE and applied math seminar (November 2019), *Lagrangian mean curvature flow and applications.*

Harvard University, Differential Geometry Seminar (April 2019), *Adiabatic limits of Yang-Mills connections on collapsing K3 surfaces.*

University of California Berkeley, Differential Geometry Seminar (November 2018), *Adiabatic limits of Yang-Mills connections on collapsing K3 surfaces.*

Luminy Institute of Mathematics, Marseille, Gauge Theory and Complex Geometry (June 2018), *Adiabatic limits of Yang-Mills connections on collapsing K3 surfaces.*

Center for Mathematical Sciences and Applications, Harvard University (March 2018), *The deformed Hermitian-Yang-Mills equation.*

University of California Irvine, Differential Geometry Seminar (February 2018), *Tangent cones of Yang-Mills connections with applications to G2 instantons.*

Michigan State University, Geometry and Topology Seminar (September 2017), *The deformed Hermitian-Yang-Mills equation.*

Imperial College, Constructions of Compact Exceptional Holonomy Spaces: Past, Present and Future (June 2017), *Hermitian Yang Mills connections on reflexive sheaves.*

National University of Singapore, Institute for Mathematical Sciences, Conference on Complex Geometry, Dynamical Systems and Foliation Theory (May 2017), *Singular Yang-Mills connections on cylindrical Kahler manifolds.*

Stanford University, Geometry Seminar (April 2017), *Tangent cones to Hermitian-Yang-Mills connections with isolated singularities in complex geometry.*

University of Oregon, Geometric Analysis Seminar (April 2017), *Tangent cones to Hermitian-Yang-Mills connections with isolated singularities.*

University of Oregon, Colloquium Talk (April 2017), *Stable classes and special Lagrangian graphs.*

Columbia University, Informal Complex Geometry and PDE Seminar (March 2017), *Tangent cones to Hermitian-Yang-Mills connections with isolated singularities.*

MSRI, Bay Area Differential Geometry Seminar (February 2017), *Singular instantons with applications to G2 manifolds.*

University of California Davis, Geometry/Topology Seminar (January 2017) *Tangent cones of Yang-Mills connections with isolated singularities.*

University of California Santa Cruz, Mathematics Colloquium (November 2016) *Stable classes and special Lagrangian graphs.*

Simons Center for Geometry and Physics, Recent Developments in the Mathematical study of Gauge Theory (October 2016) *Hermitian Yang Mills connections over asymptotically cylindrical Kähler manifolds.*

University of California Berkeley, Differential Geometry Seminar (September 2016) *A generalization of the special Lagrangian graph equation.*

MIT, workshop on Gauge theory in complex and G2 geometry (September 2016) *Hermitian Yang Mills connections over asymptotically cylindrical Kähler manifolds.*

MIT, Geometry and Topology Seminar (September 2016) *A generalization of special Lagrangian graphs.*

Stanford University, Geometry Seminar (June 2016) *A generalization of special Lagrangian graphs.*

University of California Davis, String Theory Seminar (January 2016) *Special Lagrangians, deformed Hermitian-Yang-Mills, and stability.*

University of California Davis, Geometry/Topology Seminar (January 2016) *Prescribing the angle of Lagrangian graphs.*

AMS Sectional Meeting, Special Session on Geometric Analysis, Rutgers University (November 2015). *(1,1) forms with specified Lagrangian phase.*

Harvard University, Center of Mathematical Sciences and Applications, Geometric Analysis Seminar (November 2015). *(1,1) forms with specified Lagrangian phase.*

MFO, Differentialgeometrie im Groben, Oberwolfach (June 2015). *A special Lagrangian type equation for holomorphic line bundles.*

Simons Center for Geometry and Physics, Geometric Flows Program Seminar (December 2014). *A Lagrangian mean curvature type flow for holomorphic line bundles.*

Harvard University, Center of Mathematical Sciences and Applications, Physical Mathematics Seminar (November 2014). *Partial differential equations arising from mirror symmetry.*

Rutgers University, Geometric Analysis Seminar (October 2014). *Flat bundles, harmonic metrics and singular affine structures.*

University of California Irvine, Differential Geometry Seminar (May 2014). *Flat bundles, harmonic metrics and singular affine structures.*

Northwestern University, Analysis Seminar (March 2014). *Flat bundles, harmonic metrics and singular affine structures.*

Harvard University, Gauge Theory and Topology Seminar (March 2014). *Flat bundles, harmonic metrics and singular affine structures.*

Columbia University, Analysis, Complex Geometry and Mathematical Physics: A conference in honor of D. H. Phong (May 2013). *Stable Higgs bundles and Hermitian-Einstein metrics on non-Kähler manifolds.*

University of Connecticut, PDE and Differential Geometry Seminar (December 2012). *On the Bubbling set of the Yang Mills flow,*

Harvard University, Differential Geometry Seminar (September 2012). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*

Duke University, Geometry/topology seminar (January 2012). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*

University of California San Diego, Differential Geometry Seminar (January 2012). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*

Cornell University, Analysis Seminar (November 2011). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*

Rutgers University, Complex Analysis and Geometry Seminar (November 2011). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*

Columbia University, Informal Complex Geometry and PDE Seminar (November 2011). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*

CUNY Graduate Center, Differential Geometry Seminar (May 2011). *Approximate Hermitian-Einstein structures and the Yang-Mills flow.*

Columbia University, Informal Complex Geometry and PDE Seminar (March 2011). *Existence of approximate Hermitian-Einstein structures on semi-stable bundles.*

Luminy Institute of Mathematics, Marseille, Complex and Riemannian Geometry, Young Researcher Session (February 2011). *Existence of approximate Hermitian-Einstein structures on semi-stable bundles.*

Columbia University, Informal Complex Geometry and PDE Seminar (April 2010). *Nonabelian Hodge theory.*