
Adam Jacob

CURRICULUM VITAE

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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:

- 2018 – 2023 Simons Collaboration Grant
- 2017 – 2018 UC Davis Hellman Fellow
- 2012 – 2015 NSF Postdoctoral Fellowship, Grant Number DMS-1204155
- 2012 Thesis defense awarded with distinction

Research Interests:

Differential Geometry, Complex Analysis, and Partial Differential Equations.

Publications and Preprints:

1. *Special Lagrangian submanifolds of log Calabi-Yau manifolds* (with T.C. Collins and Y.-S. Lin), preprint, arXiv:1904.08363.
2. *Adiabatic limits of anti-self-dual connections on collapsed K3 surfaces* (with V. Datar and Y. Zhang), preprint, arXiv:1809.08583.
3. *Hermitian Yang-Mills connections on collapsing elliptically fibered K3 surfaces* (with V. Datar), preprint, arXiv:1710.03898.
4. *(1, 1) forms with specified Lagrangian phase* (with T.C. Collins and S.-T. Yau), preprint, arXiv:11508.01934.
5. *Weak Geodesics for the deformed Hermitian-Yang-Mills equation*, to appear in Pure Appl. Math. Q.

6. *Poisson metrics on flat vector bundles over non-compact curves* (with T.C. Collins and S.-T. Yau), to appear in *Comm. Anal. Geom.*
7. *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.
8. *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.
9. *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.
11. *The limit of the Yang-Mills flow on semi-stable bundles*, *J. Reine Angew. Math.* 709 (2015), 1-13.
12. *Stable Higgs bundles and Hermitian-Einstein metrics on non-Kähler manifolds*, *Contemp. Math.* 644 (2015), 117-140.
13. *On the convergence of the Sasaki-Ricci flow* (with T.C. Collins), *Contemp. Math.* 644 (2015), 11-22.
14. *Existence of approximate Hermitian-Einstein structures on semi-stable bundles*, *Asian J. Math.* 18 (2014), No. 5, 859-884.
15. *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.
16. *Remarks on the Yang-Mills flow on a compact Kähler manifolds* (with T.C. Collins), *Univ. Iagel. Acta Math.* No. 51 (2013), 17-43.
17. *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.
18. *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.
19. *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:

1. Harvard University, Differential Geometry Seminar (April 2019), *Adiabatic limits of Yang-Mills connections on collapsing $K3$ surfaces.*
2. University of California Berkeley, Differential Geometry Seminar (November 2018), *Adiabatic limits of Yang-Mills connections on collapsing $K3$ surfaces.*
3. Luminy Institute of Mathematics, Marseille, Gauge Theory and Complex Geometry (June 2018), *Adiabatic limits of Yang-Mills connections on collapsing $K3$ surfaces.*
4. Center for Mathematical Sciences and Applications, Harvard University (March 2018), *The deformed Hermitian-Yang-Mills equation.*

5. University of California Irvine, Differential Geometry Seminar (February 2018), *Tangent cones of Yang-Mills connections with applications to G2 instantons.*
6. Michigan State University, Geometry and Topology Seminar (September 2017), *The deformed Hermitian-Yang-Mills equation.*
7. Imperial College, Constructions of Compact Exceptional Holonomy Spaces: Past, Present and Future (June 2017), *Hermitian Yang Mills connections on reflexive sheaves.*
8. 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.*
9. Stanford University, Geometry Seminar (April 2017), *Tangent cones to Hermitian-Yang-Mills connections with isolated singularities in complex geometry.*
10. University of Oregon, Geometric Analysis Seminar (April 2017), *Tangent cones to Hermitian-Yang-Mills connections with isolated singularities.*
11. University of Oregon, Colloquium Talk (April 2017), *Stable classes and special Lagrangian graphs.*
12. Columbia University, Informal Complex Geometry and PDE Seminar (March 2017), *Tangent cones to Hermitian-Yang-Mills connections with isolated singularities.*
13. MSRI, Bay Area Differential Geometry Seminar (February 2017), *Singular instantons with applications to G2 manifolds.*
14. University of California Davis, Geometry/Topology Seminar (January 2017) *Tangent cones of Yang-Mills connections with isolated singularities.*
15. University of California Santa Cruz, Mathematics Colloquium (November 2016) *Stable classes and special Lagrangian graphs.*
16. 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.*
17. University of California Berkeley, Differential Geometry Seminar (September 2016) *A generalization of the special Lagrangian graph equation.*
18. MIT, workshop on Gauge theory in complex and G2 geometry (September 2016) *Hermitian Yang Mills connections over asymptotically cylindrical Kähler manifolds.*
19. MIT, Geometry and Topology Seminar (September 2016) *A generalization of special Lagrangian graphs.*
20. Stanford University, Geometry Seminar (June 2016) *A generalization of special Lagrangian graphs.*
21. University of California Davis, String Theory Seminar (January 2016) *Special Lagrangians, deformed Hermitian-Yang-Mills, and stability.*
22. University of California Davis, Geometry/Topology Seminar (January 2016) *Prescribing the angle of Lagrangian graphs.*
23. AMS Sectional Meeting, Special Session on Geometric Analysis, Rutgers University (November 2015). *(1,1) forms with specified Lagrangian phase.*
24. Harvard University, Center of Mathematical Sciences and Applications, Geometric Analysis Seminar (November 2015). *(1,1) forms with specified Lagrangian phase.*
25. MFO, Differentialgeometrie im Groben, Oberwolfach (June 2015). *A special Lagrangian type equation for holomorphic line bundles.*

26. Simons Center for Geometry and Physics, Geometric Flows Program Seminar (December 2014). *A Lagrangian mean curvature type flow for holomorphic line bundles.*
27. Harvard University, Center of Mathematical Sciences and Applications, Physical Mathematics Seminar (November 2014). *Partial differential equations arising from mirror symmetry.*
28. Rutgers University, Geometric Analysis Seminar (October 2014). *Flat bundles, harmonic metrics and singular affine structures.*
29. University of California Irvine, Differential Geometry Seminar (May 2014). *Flat bundles, harmonic metrics and singular affine structures.*
30. Northwestern University, Analysis Seminar (March 2014). *Flat bundles, harmonic metrics and singular affine structures.*
31. Harvard University, Gauge Theory and Topology Seminar (March 2014). *Flat bundles, harmonic metrics and singular affine structures.*
32. 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.*
33. University of Connecticut, PDE and Differential Geometry Seminar (December 2012). *On the Bubbling set of the Yang Mills flow,*
34. Harvard University, Differential Geometry Seminar (September 2012). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*
35. Duke University, Geometry/topology seminar (January 2012). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*
36. University of California San Diego, Differential Geometry Seminar (January 2012). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*
37. Cornell University, Analysis Seminar (November 2011). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*
38. Rutgers University, Complex Analysis and Geometry Seminar (November 2011). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*
39. Columbia University, Informal Complex Geometry and PDE Seminar (November 2011). *The Yang-Mills flow and the Atiyah-Bott formula on compact Kähler manifolds.*
40. CUNY Graduate Center, Differential Geometry Seminar (May 2011). *Approximate Hermitian-Einstein structures and the Yang-Mills flow.*
41. Columbia University, Informal Complex Geometry and PDE Seminar (March 2011). *Existence of approximate Hermitian-Einstein structures on semi-stable bundles.*
42. Luminy Institute of Mathematics, Marseille, Complex and Riemannian Geometry, Young Researcher Session (February 2011). *Existence of approximate Hermitian-Einstein structures on semi-stable bundles.*
43. Columbia University, Informal Complex Geometry and PDE Seminar (April 2010). *Nonabelian Hodge theory.*