

**Christina Wiis Tønnesen-Friedman**  
*Curriculum Vitae*

Department of Mathematics, Union College, Schenectady, New York, [tonnesec@union.edu](mailto:tonnesec@union.edu)

**Employment:**

Marie Louise Bailey Professor of Mathematics, Union College 2022 -  
Professor, Union College, 2012–  
Department Chair, Union College, July 2017–July 2021  
Associate Prof., Union College, 2007 –2012  
Assistant Prof., Union College, 2001 – 2007  
Research Assistant Prof., University of Aarhus, 1997 - 2001

**Education:**

Ph.D. (Mathematics), Odense University, Denmark, 1997.  
Cand.Scient. (Mathematics and Chemistry), Odense University, Denmark, 1995.

**Dissertation:**

*Advisors:* Claude LeBrun (Stony Brook) and Henrik Pedersen (Odense).  
*Field:* Differential Geometry, Complex Geometry, Kähler Geometry.

**Publications:**

1. *Extremal Kähler Metrics on Ruled Surfaces*, Thesis, Odense University, 1997.
2. *Extremal Kähler metrics on minimal ruled surfaces*, J. reine angew. Math. 502 (1998), 175–197.
3. *Extremal Kähler Metrics and Hamiltonian Functions*, Joint work with T. Chave, H. Pedersen and G. Valent, J. Geom. Phys. 31 (1999), 25–34.
4. *Quasi-Einstein Kähler Metrics*, Joint work with H. Pedersen and G. Valent, Lett. Math. Phys. 50 (1999), 229–241.
5. *Kähler Yamabe minimizers on minimal ruled surfaces*, Math. Scand. 90 (2002), 180–241.
6. *Extremal Kähler Metrics and Hamiltonian Functions II*, Glasgow Math. J. 44 (2002), 241–253.
7. *Hamiltonian 2-forms in Kähler geometry II Global Classification*, Joint work with V. Apostolov, D. M. J. Calderbank, and P. Gauduchon. Journal of Differential Geometry 68 (2) (2004), 277–345.
8. *A remark on Kähler metrics of constant scalar curvature on ruled complex surfaces*, Joint work with V. Apostolov, Bulletin of London Mathematical Society, 38 (2006), 494–500.
9. *Hamiltonian 2-forms in Kähler geometry, III Extremal metrics and stability*, Joint work with V. Apostolov, D. M. J. Calderbank, and P. Gauduchon, Inventiones Mathematicae 173 (2008), 547–601.
10. *Hamiltonian 2-forms in Kähler geometry, IV Weakly Bochner-flat Kähler manifolds*, Joint work with V. Apostolov, D. M. J. Calderbank, and P. Gauduchon, Communications in Analysis and Geometry 16 (1) (2008), 91–126.

11. *Extremal Kaehler Metrics on Ruled Manifolds and Stability*, Joint work with V. Apostolov, D. M. J. Calderbank, and P. Gauduchon, in the proceedings of the conference in Differential Geometry in the honour of Jean-Pierre Bourguignon, IHES (France), Astérisque, 322 (2008)
12. *Generalizations of Kahler-Ricci solitons on projective bundles*, Joint work with G. Maschler, *Mathematica Scandinavica*, 108, (2011), 161–176.
13. *The Energy of a Kähler class on Admissible Manifolds*, Joint work with S.R. Simanca, *Mathematische Annalen: Volume 351, Issue 4* (2011), 805–834.
14. *Extremal Kähler metrics on projective bundles over a curve*, Joint work with V. Apostolov, D. M. J. Calderbank, and P. Gauduchon, *Advances in Mathematics*, Vol 227, Issue 6, (2011), 2385-2424.
15. *Non trivial examples of coupled equations for Kähler metrics and Yang-Mills connections*, Joint work with J. Keller, *Cent. Eur. J. Math.*, 10(5), 2012, 1673-1687
16. *Sasakian Manifolds with perfect Fundamental Group*, Joint work with C. P. Boyer, *African Diaspora Journal of Mathematics*, Special Volume in Honor of Prof. Augustin Banyaga, Volume 14, Number 2, pp. 98–117 (2012)
17. *Toric Generalized Kähler-Ricci Solitons with Hamiltonian 2-form*, Joint work with É. Legendre, *Mathematische Zeitschrift*, August 2013, Volume 274, Issue 3-4, pp 1177-1209
18. *Extremal Sasakian Geometry on  $T^2 \times S^3$  and Related Manifolds*, Joint work with C. P. Boyer, *Compositio Math.* 149 (2013), 1431–1456.
19. *Extremal Sasakian Geometry on  $S^3$ -bundles over Riemann Surfaces*, Joint work with C. P. Boyer, *Int Math Res Notices* (2014) 2014 (20): 5510-5562.
20. *The Sasaki Join and Admissible Kähler Constructions*, Joint work (survey paper) with C. P. Boyer, *Journal of Geometry and Physics* 91 (2015) 29–39, Special issue in celebration of Paul Gauduchon’s 70th birthday.
21. *On the Topology of Some Sasaki-Einstein Manifolds*, Joint work with C. P. Boyer, *New York J. Math.* 21 (2015) 57–72.
22. *The Sasaki Join, Hamiltonian 2-forms, and Constant Scalar Curvature*, Joint work with C. P. Boyer, *J. Geom. Anal.* (2016) 26, 1023–1060
23. *The Einstein-Hilbert functional and the Sasaki-Futaki invariant*, Joint work with C. P. Boyer, H. Huang, and E. Legendre, *Int Math Res Notices* (2017) 2017 (7): 1942–1974.
24. *Strongly Hermitian Einstein-Maxwell Solutions on Ruled Surfaces*, Joint work with C. Koca, *Annals of Global Analysis and Geometry* July 2016, Volume 50, Issue 1, pp 29-46.
25. *Reducibility in Sasakian geometry*, joint work with C. P. Boyer, H. Huang, and E. Legendre, *Transactions of the American Mathematical Society*, Volume 370, Number 10, October 2018, Pages 6825–6869.

26. *Sasaki-Einstein Metrics on a class of 7-Manifolds*, Joint work with C. P. Boyer, Journal of Geometry and Physics, Volume 140, June 2019, Pages 111–124
27. *On Positivity in Sasaki Geometry*, Joint work with C. P. Boyer, Geometriae Dedicata (2020) 204:149–164
28. *The Kähler geometry of Bott manifolds*, Joint work with C.P. Boyer and D. M.J. Calderbank, Advances in Mathematics, Volume 350, 9 July 2019, Pages 1-62
29. *Weighted extremal Kähler metrics and the Einstein–Maxwell geometry of projective bundles*, Joint work with V. Apostolov and G. Maschler, Communications in Analysis and Geometry, Vol. 30, No. 4 (2022), pp. 689-744
30. *Some Open Problems in Sasaki Geometry*, Joint work with C. P. Boyer, H. Huang, and E. Legendre, In O. Dearnicott, W. Tuschmann, Y. Nikolayevsky, T. Leistner, & D. Crowley (Eds.), Differential Geometry in the Large (London Mathematical Society Lecture Note Series, pp. 143-168). Cambridge: Cambridge University Press. doi:10.1017/9781108884136.009 (2020)
31. *Iterated  $S^3$  Sasaki Joins and Bott Orbifolds*, Joint work with C. P. Boyer, In Hoang Chinh Lu; Henri Guenancia; Vincent Guedj (Eds.), Analysis of Monge–Ampère, a tribute to Ahmed Zeriahi, Annales de la Faculté des sciences de Toulouse : Mathématiques, Serie 6, Volume 31 (2022) no. 3, pp. 837–860.
32. *Sasakian Geometry on Sphere Bundles*, Joint work with C. P. Boyer, Differential Geometry and its Applications, Volume 77, August 2021, 1017–65
33. *The  $S_w^3$  Sasaki Join Construction*, Joint work with C. P. Boyer, J. Math. Soc. Japan Vol. 74, No. 4 (2022), pp. 1335–1371
34. *Transverse Kähler holonomy in Sasaki Geometry and  $\mathcal{S}$ -Stability*, Joint work with C. P. Boyer and H. Huang, Complex Manifolds 2021; 8:336–353
35. *Constant Scalar Curvature Sasaki Metrics and Projective Bundles*, Joint work with C. P. Boyer, in BIRATIONAL GEOMETRY, KÄHLER-EINSTEIN METRICS AND DEGENERATIONS, Springer Proceedings in Mathematics & Statistics, Vol 409, 2023, <https://doi.org/10.1007/978-3-031-17859-7>
36. *Existence and Non-Existence of Constant Scalar Curvature and Extremal Sasaki Metrics*, Joint work with C. P. Boyer, H. Huang, and E. Legendre, Math. Z. 304, 61 (2023). <https://doi.org/10.1007/s002023-03323-5>

#### Editorial Board Member:

- *Annals of Global Analysis and Geometry* (published by Springer), since September 2020.

#### Talks:

1. Conference: “Analytic Methods in Complex Geometry”, The University of Münster (Germany), August, 2023.

2. Conference: “Sasakian manifolds, Riemannian foliations, and related topics”, Jagiellonian University Kraków, Poland, June, 2023
3. Workshop: Spinorial and Octonionic Aspects of  $G_2$  and  $\text{Spin}(7)$  Geometry (23w5006), Banff, Sunday, May 28 to Friday, June 2, 2023.
4. Mini-symposium “Global Analysis and Geometry” at the annual meeting of the DMV (Deutsche Mathematiker-Vereinigung), September 2022
5. Workshop: Interactions in Complex Geometry, Vanderbilt University, December 2021
6. Special session (Geometry and Geometric Analysis), Fall Western Sectional Meeting AMS (online), October 2021 (via Zoom).
7. Workshop on Special Geometries on Riemannian Manifolds, CRM and online (hybrid mode), Montréal, October 2021 (via Zoom).
8. Conference “Analysis of Monge-Ampère, a tribute to Ahmed Zeriahi”, Toulouse, France, June 2021 (via Zoom).
9. Geometry and Topology Seminar, Cirget, UQAM, Montréal, October 2020 (via Zoom)
10. CUNY Kähler Geometry workshop, January, 2019
11. Workshop ”Global Aspects of Projective and Kähler Geometry” in honor of Professor Futaki’s 65th birthday, at Tsinghua Sanya International Mathematics Forum (TSIMF), January, 2019.
12. Shanks Workshop on Complex Differential Geometry, Vanderbilt University, March 2018.
13. Special session (Geometric Analysis), CMS Winter Meeting, Waterloo, Ontario, December 2017.
14. Special session (Differential Geometry), Pacific Rim Math. Assoc. Congress, Oaxaca, Mexico, August 2017.
15. Generalized Geometry Workshop at Swarthmore College, September 2016.
16. Conference on Differential Geometry in honour of Claude Lebrun, CIRGET/CRM Montreal, CA, July 2016.
17. Workshop on almost hermitian and contact geometry, Bedlewo near Poznan, Poland, October 2015.
18. Bath Geometry Seminar, University of Bath, UK, March 2015.
19. Special session (Ricci Curvature for Homogeneous Spaces and Related Topics), Joint Mathematics Meetings, San Antonio, TX, January 2015.
20. Special session (Analysis and Topology in Special Geometries), AMS Regional Meeting, Albuquerque, NM, April 2014.

21. Geometry/Topology Seminar, Syracuse University, March 2014
22.  $L^2$ -Geometry and Topology Seminar, Lafayette College and Lehigh University, March 2014
23. Workshop on Extremal Kaehler Metrics, from May 26th till June 1st 2013, at the CRM in Montreal. This was a part of the thematic year on “Moduli Spaces, Extremality and Global Invariants” during 2012-13 at the CRM.
24. Geometric Structures on Manifolds and their Applications Castle Rauischholzhausen, Marburg (Germany), July, 2012
25. H-projective geometry and hamiltonian 2-forms (hpro2012), Jena (Germany), June, 2012
26. Geometry Seminar, University of New Mexico, March 2012
27. Special Session (Differential Geometry), CMS Winter Meeting, Toronto, Ontario, December 2011.
28. Gauge Theory and Complex Geometry, University of Leeds, UK, 2011.
29. Shanks workshop “Kähler and Differential Geometry”, Vanderbilt University, September, 2010.
30. Workshop on Kähler and Related Geometry, Université de Nantes, France, November, 2009.
31. Extremal Kähler metrics, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Alberta, Canada, June-July, 2009.
32. Geometric Analysis Seminar, Univ. of Wisconsin at Madison, May 2009.
33. 14th Sugadaira meeting on Complex Geometry, Japan, October 2008
34. Special Structures in Riemannian Geometry, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Alberta, Canada, February, 2008.
35. Geometry/topology Seminar, Duke University, December 2007.
36. Séminaire de géométrie-topologie, Département de Mathématiques, UQAM, Montréal, October 2007.
37. Special Session (Geometric structures on manifolds), AMS Regional Meeting, Albuquerque, NM, October 2007.
38. Geometry & Analysis Seminar, Columbia University, May, 2007.
39. Geometrie des Varietes Complexes II, Centre International de Rencontres Mathématiques (C.I.R.M.), Luminy, France, October 2006.
40. Noetherian Ring, Women’s Graduate Seminar, SUNY Albany, May, 2006.
41. Geometric Analysis Seminar, Princeton University, April, 2006.

42. Special session (Geometric structures on manifolds), AMS Regional Meeting, Miami, FL, April 2006.
43. Geometry seminar, School of Mathematics, University of Edinburgh, April 2005 (including a warm-up talk for graduate students)
44. Special session (Geometric Analysis), AMS Regional Meeting, Newark, DE, April 2005.
45. Special session (Interactions in Riemannian Geometry), AMS Regional Meeting, Albuquerque, NM, October 2004.
46. Differential Geometry and Topology, Centro di Ricerca Matematica Ennio De Giorgi, Pisa, Italy, September 2004.
47. Short Programme in Riemannian Geometry, Centre de recherches mathématiques, Université de Montréal, July 2004.
48. Geometry Seminar, Dept. of Math., University of Toronto, March 2004.
49. Special session (Geometric Structures on Manifolds), Joint Mathematics Meetings, Phoenix, AZ, January 2004.
50. Topology Seminar, Dept. of Math., SUNY Binghamton, December 2003.
51. Research seminar, Dept. of Math., Union College, November 2002.
52. Geometry-Topology Seminar, Dept. of Math., UPenn, September 2002.
53. Geometry of low dimensional manifolds and special geometries, Centre International de Rencontres Mathématiques (C.I.R.M.), Luminy, France, June 2002.
54. Séminaire de géométrie-topologie, Département de Mathématiques, UQAM, Montréal, November 2001.
55. Séminaire Arthur L. Besse, Centre de Mathématiques, Ecole Polytechnique, Palaiseau Cedex, France, June 2001.
56. Danish and Swedish Mathematics Societies joint meeting, Tekniska Högskolan, Lund, Sweden, June 2001.
57. Round table participant, *The situation for women in mathematics in Scandinavia and the USA*, joint EWM and AWM session, AMS Scand 2000, Odense, Denmark, 2000.
58. A Geometry Workshop, Dept. of Math., Odense University, Denmark, 1999.
59. Colloquium, Dept. of Math., Denmark's Technical University, Denmark, 1998.
60. A Geometry Workshop 1, Dept. of Math., Odense University, Denmark, 1997.
61. Colloquium, Dept. of Math., Odense University, Denmark, 1996.
62. Topology/Geometry Seminar, Dept. of Math., University of Aarhus, Denmark, 1996.