

*Curriculum Vitae*  
**Aleksey Zinger**

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<b>Research Interests</b>	Geometric properties of Gromov-Witten invariants in algebraic geometry and symplectic topology via analytic and topological methods; mirror symmetry and other connections with string theory and enumerative geometry
<b>Employment</b>	Stony Brook University, Department of Mathematics Professor, 09/14-Present Associate Professor, 01/09-08/14 Assistant Professor, 09/05-01/09
	Max-Planck-Institut für Mathematik Visiting Scientist, 09/15-05/16
	Institute for Advanced Study, School of Mathematics Member, 09/11-08/13, 09/20-05/21
	Stanford University, Department of Mathematics NSF Postdoc/Instructor, 09/02-08/05
<b>Education</b>	Massachusetts Institute of Technology (97-02) Ph.D. in Mathematics, June 02 Thesis Title: <i>Enumerative Algebraic Geometry via Techniques of Symplectic Topology and Analysis of Local Obstructions</i> Thesis Adviser: Tomasz Mrowka
	Massachusetts Institute of Technology (93-97) B.S. in Mathematics with minors in Physics and Economics, June 97
<b>Grants and Honors</b>	NSF CAREER and standard grants, 07/06-07/26; total \$1,521,021 Simons Fellowship, 09/20-08/21 IAS von Neumann Fellowship, 09/11-05/12 Sloan Research Fellowship, 09/06-09/10 NSF PostDoctoral Research Fellowship, 09/02-08/05 Clay Math Institute Liftoff Fellowship, Summer 02 NSF Graduate Research Fellowship, 98-01 John A. Bucsela Prize, MIT Department of Mathematics, May 97



## Other Department and University Service at Stony Brook

- Thesis exam committee member for
  - Mohamed El Alami (homology mirror symmetry), May 22
  - Mu Zhao, (symplectic topology), July 20
  - Yuhan Sun (symplectic topology), May 20
  - Yuan Gao (symplectic topology), May 18
  - Zhiyu Tian (algebraic geometry), April 11
  - Michael Chance (symplectic topology), July 09
  - Yakov Savelyev (symplectic topology), June 08
  - Yusuf Mustopa (algebraic geometry), April 08
  - Emiko Dupont (symplectic topology), July 07
  - Zhigang Han (symplectic topology), July 06
- Minor topic advisor for the oral graduate student exam for:
  - Dahye Cho (complex geometry), July 17-January 18
  - Jun Wen (mirror symmetry), October 10-March 11
  - Mark Hughes (complex geometry), March 10-February 11
  - Zhiyu Tian (pseudo-holomorphic curves), February 09-May 09
  - Canor Koca (Morse theory), April 07-February 08
  - Christopher Bay (spectral sequences), December 06-May 07
- Department representative for the oral graduate student exam for:
  - Alessandro Pilastro (hyperkähler geometry), March 24
  - Hang Yuan (symplectic topology), May 17
  - Yuhan Sun (symplectic topology), October 16
  - Yi Zhu (algebraic geometry), March 09
  - Gabriel Drummond-Cole (algebraic topology), May 06
- Member of
  - Graduate Committee, Fall 17-Spring 2021
  - Chair Selection Committee, Fall 18-Spring 19
  - Appointments Committee, Fall 10-Spring 12, Fall 13-Spring 15 (Chair, Fall 14-Spring 15)
  - Simons Lecture Committee, Fall 13-Spring 15
  - Graduate Committee, Fall 10-Spring 12
  - Math Club Committee, Fall 09-Spring 11
  - Library Committee, Fall 06-Spring 09

- Co-organizer of
  - SCGP workshop on *Moduli Spaces of Pseudo-Holomorphic Curves*, March 14
  - *Stony Brook Mathematics Colloquium*, Fall 07-Spring 09
  - *New York Area Symplectic Seminar*, Fall 05-Spring 09
  - *24th Annual Geometry Festival*, April 09
  - RTG Workshop on *Algebraic and Symplectic Geometry of Uniruled and Rationally Connected Manifolds*, March 08
  - *DusaFest* (conference in symplectic topology in honor of D. McDuff's 60th birthday), October 06
  - *Mini-Workshop at DusaFest* (short presentations by young researchers), October 06
- Coordinator for Department's graduate student awards, Spring 25
- Director for comprehensive written graduate student exam, 01/22
- Grader of comprehensive written graduate student exams:  
01/06, 08/07, 08/09, 01/11, 08/13, 08/16, 01/18, 01/24
- Advisor at incoming student orientations: Summer 06,09,10,16-19

### Other Professional Service

- Thesis exam committee member for
  - Yaim Cooper (algebraic geometry), Princeton, May 13
  - Aaron Pixton (algebraic geometry), Princeton, May 13
  - Mohammad Tehrani (symplectic topology), Princeton, August 12
  - Matt Deland (algebraic geometry), Columbia, May 09
- Co-organizer of
  - *IAS-PU Joint Symplectic Geometry Seminar*, Princeton, Fall 12-Spring 13
  - AMS Special Session on *New Developments in Symplectic Topology*, San Antonio, January 06
  - *WAGS* (Western Algebraic Geometry Seminar), Stanford, April 03
- Mentor (replacement PhD advisor) for Yaim Cooper, Princeton, Fall 11 - Spring 13
- Referee of papers for 27 different journals
- Reviewer on NSF grant and fellowship panels, 4 times
- Outside grant reviewer for Simons Foundation, NSA, NSERC (Canada), and Israel Science Foundation

## Book

1. X. Chen and A. Zinger, *Spin/Pin-Structures and Real Enumerative Geometry*, World Scientific Publishing, xiv+452pp

## Published Research Articles

1. S. Cattalani and A. Zinger, *Pseudocycles for Borel–Moore homology*, to appear in *J. Topol. Anal.*, available at <https://doi.org/10.1142/S1793525324500389>
2. A. Zinger, *The (co)homology of the Deligne–Mumford moduli spaces of marked rational curves*, *C. R. Math. Acad. Sci. Paris* 363 (2025), 429–436
3. P. Georgieva and A. Zinger, *Algebraic properties of real Gromov–Witten invariants*, *J. Math. Phys.* 66 (2025), no. 1, paper no. 012302, 30pp
4. M. Farajzadeh Tehrani, M. McLean, and A. Zinger, *Normal crossings singularities for symplectic topology: structures*, *Acta Math. Sin.* 40 (2024), no. 1, 107—160
5. X. Chen and A. Zinger, *WDVV-type relations for Welschinger’s invariants: applications*, *Kyoto J. Math.* 61 (2021), no. 2, 339—376
6. M. Farajzadeh Tehrani and A. Zinger, *On the rim tori refinement of relative Gromov–Witten invariants*, *Commun. Contemp. Math.* 23 (2021), no. 5, paper no. 2050051, 50pp
7. X. Chen and A. Zinger, *WDVV-type relations for disk Gromov–Witten invariants in dimension 6*, *Math. Ann.* 379 (2021), no. 3-4, 1231—1313
8. M. Farajzadeh Tehrani and A. Zinger, *On the refined symplectic sum formula for Gromov–Witten invariants*, *Internat. J. Math.* 31 (2020), no. 4, 2050032, 60 pp
9. A. Zinger, *Some questions in the theory of pseudoholomorphic curves*, *Geometric Analysis, in Honor of Gang Tian’s 60th Birthday*, *Progress in Math.* 333 (2020), 587–616
10. A. Zinger, *Some conjectures on the asymptotic behavior of Gromov–Witten invariants*, *Handbook for Mirror Symmetry of Calabi–Yau and Fano Manifolds*, *ALM* 47, 523–550, Higher Education Press and International Press, 2019
11. M. Farajzadeh Tehrani and A. Zinger, *Normal crossings degenerations of symplectic manifolds*, *Peking Math. J.* 2 (2019), no. 3-4, 275–351
12. A. Zinger, *Energy bounds and vanishing results for the Gromov–Witten invariants of the projective space*, *J. Geom. Phys.* 145 (2019), 103479
13. P. Georgieva and A. Zinger, *Real Gromov–Witten theory in all genera and real enumerative geometry: computation*, *J. Diff. Geom.* 113 (2019), no. 3, 417—491
14. P. Georgieva and A. Zinger, *Real Gromov–Witten theory in all genera and real enumerative geometry: properties*, *J. Symplectic Geom.* 17 (2019), no. 4, 1083–1158
15. P. Georgieva and A. Zinger, *Real Gromov–Witten theory in all genera and real enumerative geometry: construction*, *Ann. Math.* 188 (2018), no. 3, 685—752

16. M. Farajzadeh Tehrani, M. McLean, and A. Zinger, *Normal crossings singularities for symplectic topology*, Adv. Math. 339 (2018), 672—748
17. J. Niu and A. Zinger, *Lower bounds for the enumerative geometry of positive-genus real curves*, Adv. Math. 339 (2018), no. 1, 191–247
18. M. Farajzadeh Tehrani, M. McLean, and A. Zinger, *Singularities and semistable degenerations for symplectic topology*, C. R. Math. Acad. Sci. Paris 356 (2018), no. 4, 420–432
19. P. Georgieva and A. Zinger, *A recursion for counts of real curves in  $\mathbb{CP}^{2n-1}$ : another proof*, Internat. J. Math. 29 (2018), no. 4, 1850027, 21pp
20. P. Georgieva and A. Zinger, *Enumeration of real curves in  $\mathbb{CP}^{2n-1}$  and a WDVV relation for real Gromov-Witten invariants*, Duke Math. 166 (2017), no. 17, 3291–3347
21. P. Georgieva and A. Zinger, *Real orientations, real Gromov-Witten theory, and real enumerative geometry*, ERA MS 24 (2017), 87–99
22. P. Georgieva and A. Zinger, *On the topology of real bundle pairs over nodal symmetric surfaces*, Topology Appl. 214 (2016), 109–126
23. M. Farajzadeh Tehrani and A. Zinger, *Absolute vs. relative Gromov-Witten invariants*, J. Symplectic Geom. 14 (2016), no. 4, 1189–1250
24. P. Georgieva and A. Zinger, *The moduli space of maps with crosscaps: the relative signs of the natural automorphisms*, J. Symplectic Geom. 14 (2016), no. 2, 359–430
25. A. Zinger, *The determinant line bundle for Fredholm operators: construction, properties, and classification*, Math. Scand. 118 (2016), no. 2, 203–268
26. M. Farajzadeh Tehrani and A. Zinger, *Counting genus zero real curves in symplectic manifolds, Part II*, Geom. Topol. 20 (2016), no. 2, 629–695
27. P. Georgieva and A. Zinger, *The moduli space of maps with crosscaps: Fredholm theory and orientability*, Comm. Anal. Geom. 23 (2015), no. 3, 81–140
28. A. Zinger, *Double and triple Givental's  $J$ -function for stable quotients invariants*, Pacific J. Math. 272 (2014), no. 2, 439–507
29. J. Chen and A. Zinger, *The robustness of zero-determinant strategies in iterated prisoner's dilemma games*, J. Theoret. Biol. 357 (2014), 46–54
30. Y. Cooper and A. Zinger, *Mirror symmetry for stable quotients invariants*, Mich. Math. J. 63 (2014), no. 3, 571–621
31. A. Zinger, *The genus 0 Gromov-Witten invariants of projective complete intersections*, Geom. Top. 18 (2014), no. 2, 1035–1114
32. A. Popa and A. Zinger, *Mirror symmetry for closed, open, and unoriented Gromov-Witten invariants*, Adv. Math. 259 (2014), 448–510
33. A. Zinger, *On transverse triangulations*, Münster J. Math. 5 (2012), 99–106

34. A. Zinger, *A comparison theorem for Gromov-Witten invariants in the symplectic category*, Adv. Math. 228 (2011), no. 1, 535–574
35. R. Pandharipande and A. Zinger, *Enumerative geometry of Calabi-Yau 5-folds*, *New Developments in Algebraic Geometry, Integrable Systems and Mirror Symmetry*, Advanced Studies in Pure Mathematics 59 (2010), 239–288
36. A. Zinger, *Genus-zero two-point hyperplane integrals in the Gromov-Witten theory*, Comm. Analysis Geom. 17 (2010), no. 5, 1–45
37. A. Zinger, *The reduced genus-one Gromov-Witten invariants of Calabi-Yau hypersurfaces*, J. Amer. Math. Soc. 22 (2009), no. 3, 691–737
38. J. Li and A. Zinger, *On the genus-one Gromov-Witten invariants of complete intersections*, J. Diff. Geom. 82 (2009), no. 3, 641–690
39. A. Zinger, *Reduced genus-one Gromov-Witten invariants*, J. Diff. Geom. 83 (2009), no. 2, 407–460
40. A. Zinger, *A sharp compactness theorem for genus-one pseudo-holomorphic maps*, Geom. Top. 13 (2009), no. 5, 2427–2522
41. D. Zagier and A. Zinger, *Some properties of hypergeometric series associated with mirror symmetry*, *Modular Forms and String Duality*, Fields Inst. Commun. 54 (2008), 163–177
42. A. Zinger, *Standard vs. reduced genus-one Gromov-Witten invariants*, Geom. Top. 12 (2008), no. 2, 1203–1241
43. A. Zinger, *Pseudocycles and integral homology*, Trans. AMS 360 (2008), no. 5, 2741–2765
44. R. Vakil and A. Zinger, *A desingularization of the main component of the moduli space of genus-one stable maps into  $\mathbb{P}^n$* , Geom. Top. 12 (2008), no. 1, 1–95
45. A. Zinger, *Intersections of tautological classes on blowups of moduli spaces of genus-one curves*, Mich. Math. 55 (2007), no. 3, 535–560
46. R. Vakil and A. Zinger, *A natural smooth compactification of the space of elliptic curves in projective space*, ERA AMS 13 (2007), 53–59
47. J. Li and A. Zinger, *On Gromov-Witten invariants of a quintic threefold and a rigidity conjecture*, Pacific J. Math 233 (2007), no. 2, 417–480
48. A. Zinger, *On the structure of certain natural cones over moduli spaces of genus-one holomorphic maps*, Adv. Math. 214 (2007), no. 2, 878–933
49. A. Zinger, *Counting rational curves of arbitrary shape in projective spaces*, Geom. Top. 9 (2005), 571–697
50. A. Zinger, *Enumeration of genus-three plane curves with a fixed complex structure*, J. Algebraic Geom. 14 (2005), no. 1, 35–81
51. A. Zinger, *Enumeration of one-nodal rational curves in projective spaces*, Topology 43 (2004), no. 4, 793–829

52. A. Zinger, *Enumerative vs. symplectic invariants and obstruction bundles*, J. Symp. Geom. 2 (2004), no. 4, 445–543
53. A. Zinger, *Completion of Katz-Qin-Ruan’s enumeration of genus-two plane curves*, J. Algebraic Geom. 13 (2004), no. 3, 547–561
54. A. Zinger, *Enumeration of genus-two curves with a fixed complex structure in  $\mathbb{P}^2$  and  $\mathbb{P}^3$* , J. Diff. Geom. 65 (2003), no. 3, 341–467
55. M. Kalka, E. Mann, D. Yang, and A. Zinger, *The exponential decay rate of the lower bound for the first eigenvalue of compact manifolds*, Inter. J. Math. 8 (1997), no. 3, 345–355

### Other Research Preprints on arXiv

1. A. Zinger, *Smooth bowups: global vs. local perspectives*, math/2312.16112
2. P. Georgieva and A. Zinger, *Geometric properties of real Gromov-Witten invariants*, math/2311.11994
3. X. Chen, P. Georgieva, and A. Zinger, *The cohomology ring of the Deligne-Mumford space of real rational curves with conjugate marked points*, math/2305.08798
4. X. Chen and A. Zinger, *Blowdowns of the Deligne-Mumford spaces of real rational curves*, math/2305.08811
5. A. Zinger, *Real topological recursions and WDVV relations*, math/2003.05860
6. M. Farajzadeh Tehrani, M. McLean, and A. Zinger, *Normal crossings singularities for symplectic topology, II*, math/1908.09390
7. A. Zinger, *Real Ruan-Tian perturbations*, math/1701.01420
8. M. Farajzadeh Tehrani, M. McLean, and A. Zinger, *The smoothability of normal crossings symplectic varieties*, math/1410.2573v2
9. P. Georgieva and A. Zinger, *Orientability in real Gromov-Witten theory*, math/1308.1347 (superseded by Publ. 15)

### Expository Notes

- A. Zinger, *Foundations of Smooth Manifolds and Vector Bundles*, in preparation
- A. Zinger, *The Virtual Fundamental Class in Gromov-Witten Theory: the Li-Tian Construction and Beyond*, in preparation
- A. Zinger, *Equivariant Localization and Mirror Symmetry*, in preparation
- A. Zinger, *Notes on  $J$ -holomorphic maps*, math/1706.00331
- M. Farajzadeh Tehrani and A. Zinger, *On symplectic sum formulas in Gromov-Witten theory*, math/1404.1898
- A. Zinger, *Basic Riemannian geometry and Sobolev estimates used in symplectic topology*, math/1012.3980
- A. Zinger, *Counting plane rational curves: old and new approaches*, math/0507105