Biographical Sketch of Motohico Mulase

Address.

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Research Interests.

Complex Algebraic Geometry, Mirror Symmetry, Non-Abelian Hodge Theory and Opers, Integrable Nonlinear Partial Differential Equations, Global Analysis and Mathematical Physics.

Current Positions.

- Distinguished Professor of Mathematics, University of California, Davis.
- Senior Scientist, Kavli Institute for the Physics and Mathematics of the Universe, University of Tokyo.

Positions Held.

- Distinguished Professor, UC Davis, 2019–
- Professor of Mathematics, UC Davis, 1991–.
- Associate Professor of Mathematics, UC Davis, 1989–1991.
- Member, The Institute for Advanced Study, Princeton, 1988–1989.
- E. R. Hedrick Assistant Professor, UCLA, 1985–1988.
- Visiting Assistant Professor, Stony Brook University, 1984–1985.
- Member, Mathematical Sciences Research Institute, Berkeley, 1982–1984.
- Research Assistant Professor, Nagoya University, 1980–1985.

Professional Preparation.

- B.S. in Mathematics, University of Tokyo, 1978.
- M.S. in Mathematical Sciences, Research Institute for Mathematical Sciences, Kyoto University, 1980. Advisors: Mikio Sato and Heisuke Hironaka
- D.Sc. (Award Number 912), Kyoto University, 1985. Dissertation Committee: Mikio Sato and Masaki Kashiwara

Selected Visiting Positions (Since 2010).

- RIMS International Project 2024 Visiting Professor, Kyoto University, 2024.
- Member, Max-Planck-Institut für Mathematik, Bonn, 2011, 2013, 2014, 2015, 2016, 2019, 2022, 2023.
- Visiting Professor, National Tsing Hua University (NTHU), Taipei, Taiwan, 2019.
- Visiting Professor, Beijing International Center for Mathematical Research, Peking University, 2018.
- Visiting Professor, Institute for Basic Science Center for Geometry and Physics, Korea, 2017.
- Visiting Professor, Université Pierre et Marie Curie (Université Paris VI), 2015, 2017.
- Member, Institut Henri Poincaré, Paris, 2016, 2017.
- Member, MATRIX, Melbourne, Australia, 2016.
- Visiting Professor, Osaka City University, 2015, 2016.
- Visiting Professor, University of Melbourne, 2013.
- Member, Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France, 2013.
- Member, Simons Center for Geometry and Physics, 2015.
- Visiting Professor, Hong Kong University of Science and Technology, 2015.
- Visiting Professor, the Korteweg-de Vries Institute, University of Amsterdam, 2011, 2012, 2013, 2014, 2015.
- Visiting Professor, Kobe University, 2012, 2014.
- Visiting Professor, Tsinghua University, Beijing, 2010.
- Visiting Professor, Universiti Teknologi Malaysia, 2010.

Selected Administrative Appointments at UC Davis.

- Chair, Department of Mathematics, 1998–2001 and 2004–2007.
- Academic Senate Faculty Privilege and Academic Personnel Adviser, 2008–2010, 2011–2012.
- Faculty Advisory Committee to the Dean of Mathematical and Physical Sciences, 2009–2012.
- Chair, Faculty Personnel Committee for Mathematical and Physical Sciences, 2010–2013.
- Steering Committee, Division of Mathematical and Physical Sciences, 2012–2013.
- Chair, Academic Senate Step Plus Implementation Advisory Committee, 2014–2015.
- Associate Dean of the Faculty for Mathematical and Physical Sciences, College of Letters and Science, University of California, Davis. 2017–2019.

Publications Relevant to Ongoing Current Projects.

(1) M. Mulase, *In search of a hidden curves*, arXiv2501.00716 (2025)
(2) O. Dumitrescu and M. Mulase, *Interplay between opers, quantum curves, WKB analysis, and Higgs bundles*, SIGMA **17**, 036, 53 pages (2021)
(3) O. Dumitrescu, L. Fredrickson, G. Kydonakis, R. Mazzeo, M. Mulase, and A. Neitzke, *From the Hitchin section to opers through nonabelian Hodge*, J. Differ. Geom. **117** (2), 223–253 (2021).
(4) C.-C. M. Liu and M. Mulase, Editors, *Topological Recursion and its Influence in Analysis, Geometry, and Topology*, Proceedings of Symposia in Pure Mathematics **100**, 549 pps, American Mathematical Society (2018). [ISBN: 978-1-4704-3541-7]
(5) O. Dumitrescu and M. Mulase, *Edge contraction on dual ribbon graphs and 2D TQFT*, Journal of Algebra **494**, 1–27 (2018).
(6) P. Dunin-Barkowski, M. Mulase, P. Norbury, A. Popolitov, and S. Shadrin, *Quantum spectral curve for the Gromov-Witten theory of the complex projective line*, Journal für die reine und angewandte Mathematik **2017-726**, 267–289 (2017).

Five Earlier Publications with Significant Impact.

(1) M. Mulase, *Cohomological structure in soliton equations and Jacobian varieties*, Journal of Differential Geometry **19**, 403–430 (1984).
(2) M. Mulase, *Solvability of the super KP equation and a generalization of the Birkhoff decomposition*, Inventiones Mathematicae **92**, 1–46 (1988).
(3) M. Mulase and M. Penkava, *Ribbon Graphs, Quadratic Differentials on Riemann Surfaces, and Algebraic Curves Defined over* $\overline{\mathbb{Q}}$, Asian J. Math. **2** (4), 875–920 (1998).
(4) M. Mulase and B. Safnuk, *Mirzakhani's recursion relations, Virasoro constraints and the KdV hierarchy*, Indian J. Math. **50**, 189–228 (2008).
(5) B. Eynard, M. Mulase and B. Safnuk, *The Laplace transform of the cut-and-join equation and the Bouchard-Mariño conjecture on Hurwitz numbers*, Publications of the Research Institute for Mathematical Sciences **47**, 629–670 (2011).

Grant in Action.

- PI, NSF-FRG: *Collaborative Research: Complex Lagrangians, Integrable Systems, and Quantization.* DMS-2152257.

Honors.

- JMS Fellowship, Harvard University, 1982–1983.
- Member, Mathematical Sciences Research Institute, Berkeley, 1982–1984.
- Member, The Institute for Advanced Study, Princeton, 1988–1989.
- Visiting Professor, Max-Planck-Institut für Mathematik, Bonn, 1991–1992.
- RIMS International Project Research Visiting Professor, Kyoto University, 2007–2008.
- Academic Senate Distinguished Teaching Award, University of California, Davis, 2009.
- Simons Visiting Professorship, Mathematisches Forschungsinstitut Oberwolfach, 2016.
- UC Davis Distinguished Professor, 2019.

In-Person Conference Organization (Since 2010).

- AIM SQuaRE: "*Geometry and Physics of the New Topological Recursion,*" May 3–7, 2010, American Institute of Mathematics, Palo Alto, California.
- Banff International Research Station Workshop: "*New Recursion Formulae and Integrablity for Calabi-Yau Spaces,*" October 16 - October 21, 2011, in Banff, Canada.
- Banff International Research Station Workshop: "*Quantum Curves and Quantum Knot Invariants,*" June 15–June 20, 2014, in Banff, Canada.
- AIM Workshop: "*Quantum curves, Hitchin systems, and new developments in the Eynard-Orantin theory,*" September 28–October 3, 2014, in Palo Alto, California.
- OCU Workshop: "*Quantization of Spectral Curves,*" November 2–6, 2015, at the Osaka City University Advanced Mathematical Institute, Osaka, Japan.
- 2016 AMS von Neumann Symposium: "*Topological Recursion and its Influence in Analysis, Geometry, and Topology,*" July 4–8, 2016, at Hilton Charlotte University Place, Charlotte, NC.
- OCAMI Meeting: "Integrable Systems, Moduli Spaces and Non-linear PDE," September 3–4, 2016, at Osaka City University Advanced Mathematical Institute, Osaka, Japan.
- 2016 MATRIX Program: "*Interactions between topological recursion, modularity, quantum invariants and low-dimensional topology,*" November 28–December 23, 2016, at MATRIX, Creswick, Australia. Two workshops were organized:
  (1) MATRIX@Melbourne Workshop: "Quantum Invariants and Low-Dimensional Topology," December 14–17, 2016.
  (2) MATRIX@Melbourne Workshop: "Topological Recursion and Modularity," December 19–23, 2016.
- Banff International Research Station 5-Day Workshop: "Geometry and Physics of Quantum Curves (18w5078)," September 9–14, 2018, in Banff, Canada.
- MFO Mini-Workshop: "Quantization of Complex Symplectic Varieties (2240b)," October 2 - 8, 2022, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany.
- Banff International Research Station 5-Day Workshop:" Complex Lagrangians, Mirror Symmetry, and Quantization (23w5068)," October 15 – 20, 2023, in Banff, Canada.
- Research Institute for Mathematical Sciences Research Project 2024 Workshop: "New Aspects in Topological Recursion, Resurgence and Related Topics," July 8–12, 2024, at RIMS, Kyoto University, Kyoto, Japan

Invited Addresses at International Conferences, Workshops, and Summer/Winter Schools (Since 2010).

(1) UNC Mathematics Colloquium: "Quantization, Mirror Symmetry, and Riemann Zeta," University of North Carolina, Chapel Hill, April 10, 2025.
(2) Workshop on Geometry at UNC 2025: "Geometry of semi-classical limit of 1D Schrödinger operators and unique quantization as its inverse," University of North Carolina, Chapel Hill, April 8, 2025.
(3) AMS Special Session on Vector Bundles and Quantization: "Spectral curves, topological recursion, and quantization," AMS Joint Mathematics Meetings 2025, Seattle Convention Center, January 11, 2025.
(4) AMS Special Session on Structural Features in Mathematical Physics: "Toward a geometry of irrationality of the Riemann zeta value at 3," AMS Fall Western Sectional Meeting 2024 at UC Riverside, October 26, 2024.
(5) The ICMAT-UAM-UCM-UC3M Joint Colloquium: "Miraculous Integer Sequences," Aula Magna Miguel de Guzmán, Faculty of Mathematics, Complutense University of Madrid, October 11, 2024.
(6) The First MaPhyAG Workshop *Integrability, Geometry and QFT*: "Information behind a singular connection," Facultad Físicas, Plaza de las Ciencias 1, Madrid, España, October 7, 2024.

(7) SwissMAP Research Station Workshop *Topologically Recursive Behaviors*: "What I Am Thinking About Lately," The SwissMAP Research Station (SRS) Conference Centre in Les Diablerets, August 25, 2024,
(8) CMDS *One-day Lectures on Inspirations from Mathematics*: "Toward a geometry of irrationality of $\zeta(3)$," a series of two lectures, Center for Mathematical and Data Sciences, Kobe University, July 25, 2024.
(9) Joint RIMS and Mathematics Department Colloquium 2024: "Inspirations for Moduli Spaces from Counting Problems," Research Institute for Mathematical Sciences, Kyoto University, July 3, 2024.
(10) RIMS Project 2024 Seminars: *Development in Algebraic Geometry related to Integrable Systems and Mathematical Physics*, "Inspirations from Mathematics. Lecture 1: From $\zeta(3)$ to Mirror Symmetry; Lecture 2: Discontinuous and Biholomorphic?" Research Institute for Mathematical Sciences, Kyoto University, May 15 and 19, 2024.
(11) Oxford University Conference: *Complex Lagrangians, Integrable Systems, and Quantization*, "Geometry of curves and counting problems," a series of four lectures, Mathematical Institute, University of Oxford, June 5–9, 2023
(12) The 13th Mathematical Society of Japan Scientific Institute *Differential Geometry and Integrable Systems*: "The Gaiotto correspondence, quantization, and connections defined over $\overline{\mathbb{Q}}$," Osaka Central Advanced Mathematical Institute, Osaka Metropolitan University, March 11, 2023.
(13) Kolloquium über Reine Mathematik: "Quantization of Complex Lagrangians,"
Fakultät für Mathematik, Informatik und Naturwissenschaften, Universität Hamburg, Germany, November 15, 2022.
(14) Andrejewski Tage 2022: *Quivers, Representation Theory and Physics*, "Complex Lagrangian geometry and quantization", Universit zu Kln, Germany, September 7–9, 2022.
(15) Boston College Workshop: *Moduli on Chestnut Hill*, "Conformal limit of Gaiotto and holomorphic Lagrangian geometry," Boston College, March 5 - 7, 2020.
(16) Spring Emphasis Semester 2020: *Workshop on Topological and Geometric Recursion*, "Lagrangian fibration in the moduli of local systems and conformal limits," Institute of the Mathematical Sciences of the Americas, University of Miami, February 3 - 7, 2020.
(17) GRK 1670 Workshop: *BPS states, topological recursion, exact WKB and abelianisation*, "Holomorphic Lagrangian geometry of Hitchin and de Rham moduli spaces," DESY, University of Hamburg, November 25 - 28, 2019.
(18) Kavli IPMU Seminar: *Mathematics - String Theory*, "Gaiotto's Lagrangian correspondence between Hitchin and de Rham moduli spaces," Kavli Institute for the Physics and Mathematics of the Universe, University of Tokyo, September 17, 2019.
(19) GEOQUANT 2019: *International School and Conference on Geometry and Quantization*, "Quantization of Higgs bundles through the Gaiotto correspondence," series of 4 lectures, National Tsing Hua University, Hsinchu, Taiwan, September 4 - 6, 2019.
(20) MPIM Seminar: *Algebra, Geometry, and Physics*, "Algebraic geometry of the Lagrangian correspondence of Gaiotto," Max-Planck-Institut für Mathematik, Bonn, August 27, 2019.
(21) Conference: *Current trends in Hitchin systems*, "Topological recursion, quantum curves, and Hitchin moduli spaces," Universidad de Buenos Aires, Argentina, December 17, 2018.
(22) RIMS Conference: *D-modules, quantum geometry, and related topics*, "Duality of surface graphs and CohFT," Research Institute for Mathematical Sciences Conference, Kyoto University, December 3, 2018.
(23) The Eighth BICMR Advanced Seminar: *Symplectic Geometry and Topological Field Theory*, "Topological recursion in geometry," series of four 2-hour lectures, Beijing International Center for Mathematical Research, Peking University, October 2018.
(24) 2018 ERC Conference: *Quantum Fields, Knots, and Strings*, "Ribbon graphs, Frobenius-Hopf duality, and CohFT," University of Warsaw, Poland, September 2018.
(25) 2018 Summer School of the TRR 195 and the Graduiertenkolleg Experimental and constructive algebra *Topological Recursion*, "Magic of Ribbon Graphs," series of three 90-min lectures, University of Tübingen, August 2018.

(26) 2018 Les Diablerets Winter School in Mathematical Physics: "Quantum Curves," a series of 4 lectures, Les Diablerets, Switzerland, January 2018.
(27) Institute for Basic Science Center for Geometry and Physics Intensive Lecture Series: "Topological Recursion and Quantum Curves," a series of 5 lectures, Pohang, Korea, September 2017.
(28) IHÉS Conference: *Algebraic Analysis*, "Quantum Curves." Institut des Hautes Études Scientifiques, Bures-sur-Yvette, June 6, 2017.
(29) LJAD Conference: *Higgs Bundles and Related Topics*, "An Invitation to Quantum Curves and 2D TQFT." Laboratoire J.A. Dieudonné, Nice, May 31, 2017.
(30) IST Austria: *Algebraic Geometry Seminar*, "Ribbon graph formulation of CohFT and 2D TQFT." Institute of Science and Technology, Austria, March 22, 2017.
(31) IHP Workshop: *Enumerative Geometry and Combinatorics of Moduli Spaces*, "From Cayley to Hurwitz to Hitchin." Institut Henri Poincaré, Paris, March 15, 2017.
(32) QUANTMOD: *Quantization and Moduli Spaces*, "Holomorphic quantization of Higgs bundles." Université du Luxembourg, January 12, 2017.
(33) MATRIX Conference: *Topological recursion and modularity*, "Category of cell graphs and a new set of axioms for 2D TQFT." MATRIX, Creswick, Australia, December 22, 2016.
(34) Kobe 2016 International Conference: *Algebraic Geometry and Integrable Systems*, "Algebraic geometry of quantum curves and opers." Kobe University, Japan, December 8, 2016.
(35) The 15th Oka Symposium: "Quantization of Hitchin spectral curves and holomorphic Lagrangians." Oka Mathematical Institute, Nara, Japan, December 4, 2016.
(36) BIRS Workshop: *Painlevé Equations and Discrete Dynamics*, "Quantization of Hitchin spectral curves as opers." Banff International Research Station, Banff, Canada, October 4, 2016.
(37) RIMS Workshop: *Studies on Integrable Systems: State of the Art and Perspective for Future*, "Quantization of Higgs bundles and opers." Research Institute for Mathematical Sciences, Kyoto University, September 6, 2016.
(38) OCAMI Meeting: *Integrable Systems, Moduli Spaces and Non-linear PDE*, "Quantization of Hitchin spectral curves, opers, and their WKB analysis via topological recursion." Osaka City University Advanced Mathematical Institute, Osaka, September 3, 2016.
(39) Infinite Analysis 2016 Summer School: *Integrable Hierarchies and Beyond*, A series of three 1-hour talks. 1 "World of character varieties." 2 "Quantization of Higgs bundles." 3 "Opers and quantum curves." Graduate School of Mathematics, Nagoya University, August 30, 31, September 1, 2016.
(40) SCGP Workshop: *New perspectives on Higgs bundles, branes and quantization*, "Algebraic geometry of Gaiotto correspondence and quantization of Higgs bundles." Simons Center for Geometry and Physics, Stony Brook, June 17, 2016.
(41) ICTS-TIFR Conference: *Higgs Bundles*, "Quantum Curves and Gaiotto's Conjecture." International Center for Theoretical Sciences, Tata Institute of Fundamental Research Bangalore, India, March 23, 2016.
(42) IMAR Lecture Series: *Algebraic Geometry*, "A family of deformations that connects Higgs bundles and opers." Institute de Matematica "Simion Stoilow" al Academiei Romane, Bucharest, Romania, February 25, 2016.
(43) MFO Workshop: *Topological Recursion and TQFTs*, "Solution to Gaiotto Conjecture and Quantum Curves." Mathematisches Forschungsinstitut Oberwolfach, Germany, February 14, 2016.
(44) University of Luxembourg: *RMATH General Mathematics Seminar*, "A formula for Non-Abelian Hodge theory through Gaiotto's conjecture." Mathematics Research Unit, University of Luxembourg, Luxembourg, February 9, 2016.
(45) Warsaw Advanced School: *Topological Quantum Field Theory*, A series of four lectures. Faculty of Physics, University of Warsaw, Poland, December 7 - 10, 2015.
(46) OCU Workshop: *Quantization of Spectral Curves*, "Opers and quantum curves." Osaka City University Advanced Mathematical Institute, Osaka, Japan, November 4, 2015.

(47) GEOQUANT 2015: *School and International Conference on Geometry and Quantization*, "Topological recursion, 2D TQFT, and quantization of Hitchin spectral curves." Instituto de Ciencias Mathemáticas (ICMAT), Madrid, Spain, September 14, 2015.
(48) MPIM-Bonn: *Mathematische Arbeitstagung 2015*, "The topological recursion – an inductive mechanism of counting on the moduli of curves." Max-Planck-Institut für Mathematik, Bonn, Germany, June 27, 29, 2015.
(49) Kolloquium des Graduiertenkollegs 1463: *Analysis, Geometrie und Stringtheorie*, "The story that a graph on a surface weaves." Leibniz Universität, Hannover, Germany, June 8, 2015.
(50) Lorentz Center Workshop: *Geometric Invariants and Spectral Curves*, "2D TQFT from cellular graphs and a TQFT-valued topological recursion." Lorentz Center, Leiden, the Netherlands, June 5, 2015.
(51) SCGP Program: *Knot homologies, BPS states, and SUSY gauge theories*, "Topological recursion and quantization." Simons Center for Geometry and Physics, May 14, 2015.
(52) HKUST *Seminar on Geometry*, (A series of 10 lectures): "Introduction to the topological recursion and quantum curves." Hong Kong University of Science and Technology, March 24 - April 20, 2015.
(53) WAGS Spring 2015: *Western Algebraic Geometry Symposium*, "Topological recursion and quantum curves." University of California, Davis, March 1, 2015.
(54) MPIM Workshop: *Geometric quantization and topological recursion*, "Quantum curves and Hitchin fibrations." Max-Planck-Institut für Mathematik, Bonn, November, 2014.
(55) EIMI International Conference: *Embedded Graphs*, "Enumeration of embedded surface graphs and quantum curves." Euler International Mathematical Institute, St. Petersburg, Russia, October 2014.
(56) AIM Workshop: *Quantum curves, Hitchin systems, and the Eynard-Orantin theory*, "An introductory remark on quantum curves." American Institute of Mathematics, Palo Alto, California, September 2014.
(57) Advanced Summer School: *Modern Trends in Gromov-Witten Theory*, "Quantum curves, topological recursion, and Hitchin systems." A series of three1-hour lectures, Leibniz Universität Hannover, September 2014.
(58) Kobe Summer School: *Advanced Science and Technology Graduate Course 2014*, "A mathematical theory of quantum curves: what they are, and what they do." A series of eight 1.5-hour lectures, Kobe University, July 2014.
(59) IMS Summer Research Institute: *The Geometry, Topology and Physics of Moduli Spaces of Higgs Bundles*, "Quantization of spectral curves of Higgs bundles via a B-model topological recursion." (Lecture I, 7/10/2014) (Lecture II, 7/11/2014) Institute for Mathematical Sciences, National University of Singapore, July 2014.
(60) International Conference: *The Mathematics of Quantum Theory in Honor of Professor Albert Schwarz at his 80th Birthday*, "A mathematical approach to quantum curves." UC Davis, California, May 2014.
(61) MPIM Yuri Manin Seminar: *Algebra, Geometry and Physics*, "Algebraic geometry of quantum curves and classical differential equations." Max-Planck-Institut für Mathematik, Bonn, May 2014.
(62) Oxford Lecture: *Mathematical Institute Geometry and Analysis Seminar*, "Quantum curves for Higgs bundles and quantum invariants." Mathematical Institute, University of Oxford, May 2014.
(63) Cortona Conference: *Mirror Symmetry and Spin Curves*, "Quantum curves: what they are, and what they do." Palazzone di Cortona, Italy, April 2014.
(64) SMS Spring Conference: *Quantization of Moduli Spaces*, "Construction of quantum spectral curves for Higgs bundles via a new topological recursion." Villa Battelle, University of Geneva, Switzerland, April 2014.
(65) KdV Workshop: *Moduli of curves and mathematical physics*, "Quantum curves for Hitchin fibrations." Korteweg-de Vries Institute, Amsterdam, the Netherlands, January 2014.

(66) IHES Séminaire de Mathématiques *organisé par Mikhail Gromov, Laurent Lafforgue, Maxim Kontsevich*: "Quantum curves for Hitchin systems and the Eynard-Orantin theory." l'Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France, November 2013.

(67) SISSA Workshop on *Hamiltonian PDEs, Frobenius Manifolds, and Deligne-Mumford Moduli Spaces,* "Quantum curves for Hitchin fibrations." La Scuola Internazionale Superiore di Studi Avanzati, Trieste, Italy, September 2013.

(68) BIRS Workshop on *Integrable Systems and Moduli Spaces* (13w5064): "Quantum curves and topological recursion." Banff International Research Station, Canada, August 2013.

(69) 5th IST Lectures on *Algebraic Geometry and Physics – 2013*: "The Eynard-Orantin recursion, algebraic geometry, and quantum invariants (Series of two 1.5 hour lectures)," Instituto Superior Técnico, Lisbon, Portugal. February 2013.

(70) QGM Conference on *Topological recursion and quantum algebraic geometry,* "Quantum curves for geometric enumeration problems." Center for Quantum Geometry of Moduli Spaces, Aarhus University, Denmark. January-February 2013.

(71) BIRS Workshop on *Integrable systems, growth processes and KPZ universality* (12w5015), "The Eynard-Orantin recursion and quantum invariants in geometry." Banff International Research Station, Canada. September 2012.

(72) XXXI Workshop on *Geometric Methods in Physics*: "The Laplace Transform, Mirror Symmetry, and the Topological Recursion of Eynard-Orantin." Białowieża, Poland. June 2012.

(73) BICMR *Conference on Symplectic Geometry and Mathematical Physics*: "The Laplace transform of the Catalan numbers and the Eynard-Orantin recursion." The Beijing International Center for Mathematical Research, Beijing. June 2012.

(74) The Hausdorff Research Institute for Mathematics Workhsop *Integrability in Topological String Theory*: "Laplace transform of Catalan Numbers and Topological Recursion." The Hausdorff Research Institute for Mathematics, Bonn. April 2012.

(75) The Fourier Institute *Conference on Gromov-Witten Theory*: "Counting the lattice points on the moduli space of curves." The Fourier Institute, Grenoble. July 2011.

(76) The Fourier Institute *Summer School on Moduli of Curves and Gromov-Witten Theory*: "Hurwitz numbers and new recursion formulae in GW theory." A series of lectures delivered at the Fourier Institute, Grenoble. June 2011.

(77) BIRS Workshop on *Number Theory and Physics at the Crossroads* "A topological recursion in B-model as the Laplace transform of a combinatorial equation." Banff International Research Station. May 2011.

(78) Fifth Ibero-American Congress on Geometry: "Topological Recursion in Gromov-Witten Theory." Pucón, Chile. December 2010.