

Curriculum Vitae



PERSONAL INFORMATIONS:

🇮🇹 Italian citizen

🎂 27 September 1989

✉ danilo.lewanski@ipht.fr

🏠 Inst. Hautes Études Scientifiques (IHES) and Inst. Physique Théorique (IPhT), Paris, France

📧 danilo.lewanski

Education and professional experience

Post-doctoral researcher

*Jussieu-Paris Rive Gauche,
Sorbonne Université, Paris, FR*

Nov 21 - Oct 23

Funded by the ERC Consolidator Grant “ROGW” 864919 with PI Prof. Giorgieva.

Post-doctoral researcher

IHES and IPhT, Paris, FR

Nov 19 - Oct 21

Funded by the ERC Synergy Grant “ReNewQuantum” with PI Prof. Andersen, Prof. Eynard, Prof. Kontsevich, Prof. Mariño.

Post-doctoral researcher

Max-Planck-Institut, Bonn, DE

Nov 17 - Oct 19

PI: Gaëtan Borot and Don Zagier.

Ph.D. in Mathematics

Univ. Amsterdam, NL

Nov 13 - Oct 17

Thesis Title: “Enumerative geometry and moduli spaces of curves via topological recursion”

Topics: Algebraic Geometry and Mathematical Physics

Supervisor: Sergey Shadrin

M.Sc. in Mathematics

Università di Padova, IT

Sep 11 - Jul 13

Specialization in Algebra, Geometry and Number Theory (ALGANT courses)

Thesis title: “Moduli Spaces in Algebraic Geometry” on Mumford’s Geometric Invariant Theory

Thesis Supervisor: Francesco Bottacin

B.Sc. in Mathematics

Università di Bologna, IT

Sep 09 - July 11

Thesis title: “Knot Theory of robotic arms in 3D and 4D spaces” on Algebraic Topology

Thesis Supervisor: Massimo Ferri

Publications and preprints

A new spin on Hurwitz theory and ELSV via theta characteristics

Article

ARXIV:2104.05697, SUBMITTED

2021

Joint work with A. Giacchetto, R. Kramer

On the Kontsevich Geometry of the combinatorial Teichmüller space ARXIV:2010.11806, SUBMITTED Joint work with J. Andersen, G. Borot, S. Charbonnier, A. Giacchetto, C. Wheeler	<i>Article</i> 2020
On the Goulden-Jackson-Vakil conjecture for double Hurwitz numbers ARXIV:2003.08043, SUBMITTED Joint work with N. Do.	<i>Article</i> 2020
Double Hurwitz numbers: polynomiality, topological recursion and intersection theory ARXIV:2002.00900, SUBMITTED Joint work with G. Borot, N. Do, M. Karev, E. Moskovsky.	<i>Article</i> 2020
Masur-Veech volumes and intersection theory: the principal strata of quadratic differentials ARXIV:1912.02267, SUBMITTED D. Chen, M. Möller, A. Sauvaget, with an appendix joint with G. Borot, A. Giacchetto	<i>Appendix</i> 2019
Topological recursion for Masur-Veech volumes ARXIV:1905.10352, SUBMITTED Joint work with J. Andersen, G. Borot, V. Delecroix, S. Charbonnier, A. Giacchetto, C. Wheeler	<i>Article</i> 2019
Wall-crossing and recursion formulae for tropical Jucys covers ARXIV: 1905.02247, TRANSACTIONS OF THE AMERICAN MATHEMATICAL SOCIETY 373 (2020), 4685-4711 Joint work with M. Anas Hahn.	<i>Article</i> 2019
Half-spin tautological relations and Faber's proportionalities of kappa classes SYMMETRY, INTEGRABILITY AND GEOMETRY: METHODS AND APPLICATIONS (SIGMA), 15, [080] Joint work with E. Garcia Failde, R. Kramer, S. Shadrin	<i>Article</i> 2019
Tropical Jucys covers ARXIV: 1808.01383, SUBMITTED Joint work with M. Anas Hahn.	<i>Article</i> 2018
Harer-Zagier formula via Fock space COMMUNICATIONS IN NUMBER THEORY AND PHYSICS, 13 (2019), 3, 619-626	<i>Article</i> 2018
Wall-crossing formulae and strong piecewise polynomiality for mixed Grothendieck dessins d'enfants, monotone and simple double Hurwitz numbers ADVANCES IN MATHEMATICS 336 (2018), 38-69 Joint work with M. Anas Hahn, R. Kramer.	<i>Article</i> 2017
Special cases of the orbifold version of Zvonkine's r-ELSV formula MICHIGAN MATHEMATICAL JOURNAL, ADVANCE PUBLICATION (2020), 34 PAGES Joint work with G. Borot, R. Kramer, A. Popolitov, S. Shadrin.	<i>Article</i> 2017
Towards an orbifold generalization of Zvonkine's r-ELSV formula TRANSACTIONS OF THE AMERICAN MATHEMATICAL SOCIETY, 372 (2019), 4447-4469 Joint work with R. Kramer, A. Popolitov, S. Shadrin.	<i>Article</i> 2017

On ELSV-type formulae, Hurwitz numbers and topological recursion

AMS PROCEEDINGS OF SYMPOSIA IN PURE MATHEMATICS, VOLUME 100, 2018.

[HTTPS://DOI.ORG/10.1090/PSM/100/01764](https://doi.org/10.1090/PSM/100/01764).

Expository

2017

The tautological ring of $\mathcal{M}_{g,n}$ via Pandharipande-Pixton-Zvonkine r -spin relations

ALGEBRAIC GEOMETRY 5.6 (2018), 703-727

Joint work with R.Kramer, F. Labib, S. Shadrin

Article

2017

Quasi-polynomiality of monotone orbifold Hurwitz numbers and Grothendieck's dessins d'enfant

DOCUMENTA MATHEMATICA 24, 857-898 (2019)

Joint work with R.Kramer, S. Shadrin

Article

2016

Ramifications of Hurwitz theory, KP integrability and quantum curves

JOURNAL OF HIGH ENERGY PHYSICS, 2016(5), DECEMBER 2015

Joint work with A. Alexandrov, S. Shadrin

Article

2016

\mathcal{W} -algebra constraints and topological recursion for A_N -singularity

INTERNATIONAL JOURNAL OF MATHEMATICS 27, 1650110(2016)

The main author is T. Milanov, appendix by D. Lewanski

Appendix

2016

Polynomiality of orbifold Hurwitz numbers, spectral curve, and a new proof of the Johnson-Pandharipande-Tseng formula

JOURNAL OF THE LONDON MATHEMATICAL SOCIETY 92(3), 547-565, APRIL 2015.

Joint work with P. Dunin-Barkowski, A. Popolitov, S. Shadrin

Article

2015

Chiodo formulas for the r -th roots and topological recursion

LETTERS IN MATHEMATICAL PHYSICS, 107(5), 901-919.

Joint work with A. Popolitov, S. Shadrin, D. Zvonkine

Article

2015

Selected Talks

Invited talk: A new spin for Hurwitz numbers and Chiodo classes

ENUMERATIVE GEOMETRY OF SURFACES

Oberwolfach, DE

Jun, 2021

Invited talk: A new spin for Hurwitz numbers and Chiodo classes

CONFERENCE MOSCATR VII

Moscow, RUS

Jun, 2021

Invited talk: Cohomologie des espaces de modules des courbes de la physique mathématique.

MATHEMATICAL PHYSICS SEMINAR

IMB, Dijon, FR

Mar, 2021

Invited talk: ELSV-type formulae and new conjectures for BKP integrability II .

INTERNATIONAL TOPOLOGICAL RECURSION AND INTEGRABILITY SEMINAR

Higher School for Economics,

Moscow, RUS

Mar, 2021

Invited talk: ELSV-type formulae and new conjectures for BKP integrability I .

INTERNATIONAL TOPOLOGICAL RECURSION AND INTEGRABILITY SEMINAR

*Higher School for Economics,
Moscow, RUS
Mar, 2021*

Invited talk: Cohomologie des espaces de modules des courbes de la physique mathématique.

GENERAL MATHEMATICAL SEMINAR

*IMB and LaBRI, Bordeaux, FR
Feb, 2021*

Invited talk: Mathematical Physics for the Algebraic Geometry of moduli spaces of curves.

*Copenhagen University, DK
Feb 2021*

Invited talk: Interaction between string theory, integrable systems and moduli spaces of curves.

GEOMETRY SEMINAR

*KU Leuven, BE
Feb 2021*

Invited talk: Topological recursion, matrix models, and moduli spaces of curves.

MATHEMATICAL PHYSICS SEMINAR

*SISSA Trieste, Italy
Jan, 2021*

Invited talk: Resurgent Topological Recursion.

CONFERENCE WINTER SCHOOL IN MATHEMATICAL PHYSICS 2021

*Les Diablerets, CH
Jan 2021*

Invited talk: Topological Recursion for Hurwitz theory and intersection theory of moduli spaces of curves.

*Bologna University, Italy
Jan 2021*

Invited talk: Hurwitz theory, topological recursion, and ELSV formulae

CONFERENCE TOPOLOGICAL AND GEOMETRIC RECURSION IN INTERACTION WITH RESURGENCE

*Miami, USA
Feb, 2020*

Resurgence theory

UNIVERSITY OF MELBOURNE

*Melbourne, RUS
Feb, 2020*

Invited talk: on a conjecture of Goulden, Jackson, and Vakil

JUSSIEU ENUMERATIVE GEOMETRY SEMINAR

*Paris, FR
Dec 5, 2019*

Invited talk: Topological recursion and Masur-Veech volumes

IHES ENUMERATIVE GEOMETRY SEMINAR

*Paris, FR
Dec 2, 2019*

Invited talk: Topological recursion and Masur-Veech volumes

INTERNATIONAL SYMPOSIUM QUANTUM THEORY AND SYMMETRIES AT CRM MONTRÉAL

*Montréal, CAN
Jul 2, 2019*

Invited talk: Tropical Jucys covers

UNIVERSITÉ DE GENÈVE

*Genève, CH
Mar 18, 2019*

Invited Talk: Virasoro constraints for simple maps and free probability

CONFERENCE MOSCATR VI

Moscow, *RUS*

June 7, 2018

Invited Talk: Tautological ring and Pandharipande-Pixton-Zvonkine tautological relations

UNIVERSITÉ DE BOURGOGNE

Dijon, *FR*

Sep 7, 2017

Invited Talk: Orbifold Hurwitz numbers, topological recursion and ELSV-type formulae

WINTER SCHOOL ON COMBINATORICS AND INTERACTIONS, CIRM

Marseille, *FR*

Jan 13, 2017

Invited Talk: Topological recursion and Hurwitz numbers

CONFERENCE TOPOLOGICAL RECURSION AND MODULARITY

Matrix center, Creswick, *USA*

Dec 22, 2016

Contributed Talk: From Topological Recursion to Johnson-Pandharipande-Tseng Formula (and back)

2016 AMS VON NEUMANN SYMPOSIUM: TOPOLOGICAL RECURSION AND ITS INFLUENCE IN ANALYSIS, GEOMETRY, AND TOPOLOGY

Charlotte, *NC, USA*

Jul 6, 2016

Contributed Talk: On Hurwitz enumerative problems

FIFTH WORKSHOP ON COMBINATORICS OF MODULI SPACES, HURWITZ NUMBERS, AND COHOMOLOGICAL FIELD THEORIES

Moscow, *RUS*

Jun 9, 2016

Invited Talk: Gromov-Witten Invariants

CONFERENCE PROSPECTIVES IN PHYSICAL MATHEMATICS

Bologna, *IT*

Dec 18, 2014

Scientific expeditions

Matrix Institute, Creswick, Australia

Event *Interactions between topological recursion, modularity, quantum invariants and low-dimensional topology*, November-December 2016

Institut Henri Poincaré, Paris

Thematic trimester *Combinatorics and interactions*, February-March 2017

Monash University, Melbourne

Bartnik Visiting Grant awardee ($\sim 8k$ AUD) with host Prof. N. Do, February 2019

Amsterdam University

Research visit with host Prof. S. Shadrin, July 2019

Monash University, Melbourne

Research visit with host Prof. N. Do, February 2020

Melbourne University

Research visit with host Prof. P. Norbury, March 2020

UniSalento University

Research visit with host Prof. R. Vitolo, June 2021

Service

Journal Referee

Referee for Manuscripta Mathematica, Communications in Mathematical Physics, Journal of High Energy Physics, Selecta Mathematica, SIGMA.

Conferences

TRSalento2021: School/Workshop on Topological Recursion

Otranto, Salento region, *IT*

Sep 6- Sep 17, 2021

Noncommutative geometry meets topological recursion

Münster, *DE*

Aug 16 - Aug 20, 2021

MFO Workshop: Enumerative geometry of surfaces

Oberwolfach, DE

Jun 14 - Jun 18, 2021

MOSCATR VII: 7th Workshop on Combinatorics of Moduli Spaces, Cluster Algebras, and Topological Recursion

Moscow, RU

May 31 - Jun 5, 2021

Conference Winter School in Mathematical Physics 2021

Les Diablerets, CH

Jan 2021

Conference Topological and Geometric Recursion in Interaction with Resurgence

Miami, USA

Feb, 2020

International Symposium Quantum Theory and Symmetries at CRM Montréal

Montréal, CAN

Jul 2, 2019

ICM 2018: International Conference of Mathematicians

Rio, BR

Aug 1-9, 2018

MOSCATR VI: 6th Workshop on Combinatorics of Moduli Spaces, Cluster Algebras, and Topological Recursion

Moscow, RU

June 4-9, 2018

Workshop on Moduli Spaces of Curves, Integrable Systems and related subjects

Dijon, FR

Sep 4-8, 2017

Trimester Combinatorics and Interactions, IHP

Paris, FR

Feb 27- Mar 31, 2017

Winter school on combinatorics and interactions, CIRM

Marseille, FR

Jan 9-13, 2017

Interactions between Topological recursion, modularity, quantum invariants and low-dimensional topology, Matrix center

Creswick, AUS

Nov 28 - Dec 23, 2016

2016 AMS von Neumann Symposium: Topological Recursion and its Influence in Analysis, Geometry, and Topology

Charlotte, NC, USA

Jul 4-8, 2016

Fifth Workshop on Combinatorics of Moduli Spaces, Hurwitz numbers, and Cohomological Field Theories

Moscow, Russia

HSE, STEKLOV INSTITUTE, SKOLKOVO INSTITUTE OF SCIENCE AND TECHNOLOGY AND INDEPENDENT UNIVERSITY

Jun 6-11, 2016

2015 AMS Summer Research Institute in Algebraic Geometry

UNIVERSITY OF UTAH

Salt Lake City, UT, USA

Jul 13-24, 2015

Counting Instantons

LORENTZ CENTER

Leiden, The Netherlands

Jun, 16-20, 2015

Workshop on mathematical physics

UNIVERSITEIT VAN AMSTERDAM

In occasion of the PhD Defense of Petr Dunin-Barkowski

Amsterdam, The Netherlands

May 26-28, 2015

Perspectives in Physical Mathematics

UNIVERSITÀ DI BOLOGNA

Bologna, Italy

Dec 18-19, 2014

Geometry and Quantum Theory Colloquium

GQT CLUSTER

The Netherlands

Nov 6-7, 2014

Geometry and Quantum Theory Colloquium

GQT CLUSTER

The Netherlands

Jul 3-4, 2014

Workshop on Instanton Counting: Moduli Spaces, Representation Theory and Integrable Systems

LORENTZ CENTER

Leiden, The Netherlands

Jun 16, 2014

Fourth Workshop on Combinatorics of Moduli Spaces, Cluster Algebras and Topological Recursion

HSE, STEKLOV INSTITUTE, AND INDEPENDENT UNIVERSITY

Moscow, Russia

May 26-31, 2014

Mirror Symmetry and Spin Curves

PALAZZONE DI CORTONA

Cortona, Italy

Apr 28-30, 2014

On Quantization of Moduli Spaces

Geneva, Switzerland

Apr 22-25, 2014

Moduli of curves and mathematical physics

UNIVERSITEIT VAN AMSTERDAM

In occasion of the PhD Defense of Loek Spitz

Amsterdam, The Netherlands

Jan 23, 2014

Geometry and Quantum Theory Colloquium

GQT CLUSTER

The Netherlands

Jan 17-18, 2014

Workshop on Algebraic Cycles and Tautological classes

In occasion of the PhD Defense of Qizheng Yin

Nijmegen, The Netherlands

Dec 18, 2013

VBAC2013: Hilbert Schemes, Sheaves and Representations

SISSA

Trieste, Italy

Jun 17-21, 2013

Teaching

PhD mini-course: Topological recursion for algebraic geometry

Lecturer

Sorbonne U Paris (FR), Nov 2021

PhD mini-course: Hurwitz theory and topological recursion

Lecturer

School TRSalento2021 (IT), Sep 2021

PhD mini-course: Hurwitz theory and enumerative geometry

Lecturer

U Nairobi (KE), Aug 2021

PhD mini-course: Moduli spaces of curves and topological recursion

Lecturer

UniSalento Lecce (IT), Jun 2021

Outreach teaching activities with SAMI (see below)

Lecturer

TOPOLOGY, GEOMETRY, ALGEBRA, PROBABILITY, PHYSICS, PROGRAMMING COURSES

African maths institutes, 2016 - 2021

Wiskunde N2

Assistant

ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

U Amsterdam (NL), Fall 16

Algebra I

Assistant

GROUP THEORY

U Amsterdam (NL), Spring 15

Wiskunde N2

Assistant

ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

U Amsterdam (NL), Fall 15

Algebra I

Assistant

GROUP THEORY

U Amsterdam (NL), Spring 15

Wiskunde N2

Assistant

ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

U Amsterdam (NL), Fall 14

Galois Theorie

Assistant

GALOIS THEORY

U Amsterdam (NL), Spring 14

Wiskunde N3

Assistant

COMPLEX ANALYSIS

U Amsterdam (NL), Fall 13

Outreach activities

Development of a open-access maths educational online repository for local delivery in times of Covid-19 pandemic (<https://virtualmathscamp.com>)

LEADING THE VIDEO TEAM AS A DIRECTOR OF SAMI (SUPPORTING AFRICAN MATHEMATICS INITIATIVES)

Team leader

Summer-Fall 20

SAMI (Supporting African Mathematics Initiatives) Maths Camp Rwanda

ORGANISER OF A TWO WEEKS MATHS CAMP FOR HIGH SCHOOL STUDENTS

Main organizer

Summer 19

"Crosspollination" workshop on maths education in Africa in Cape Coast, Ghana

ESTABLISHING A COMMUNITY OF PRACTICE WITH INTERNATIONAL MATHS EDUCATORS AT DIFFERENT LEVELS

Speaker and participant

Spring 19

SAMI (Supporting African Mathematics Initiatives) Maths Camp Kenya

VOLUNTEERING IN A TWO WEEKS MATHS CAMP FOR HIGH SCHOOL STUDENTS

Co-organizer

Summer 18

SAMI (Supporting African Mathematics Initiatives) Maths Camp Ghana

VOLUNTEERING IN A TWO WEEKS MATHS CAMP FOR HIGH SCHOOL STUDENTS

Co-organizer

Summer 17

SAMI (Supporting African Mathematics Initiatives) Maths Camp Tanzania

VOLUNTEERING IN A TWO WEEKS MATHS CAMP FOR HIGH SCHOOL STUDENTS

Co-organizer

Summer 16

Skills

Programming Mathematica, Matlab, C/C++, LaTeX

Languages Italian (Mother tongue), English (C1), Spanish, French (B2), Dutch, German (B1)

Others Judo instructor for children and adults for two years, Scout chief, one year Civil Service

Si autocertifica che tutto quanto dichiarato in questo curriculum vitae corrisponde a verità, ai sensi degli articoli 46 e 47 del D.P.R. 445 del 2000.