Curriculum Vitae
Oscar Salomon Kivinen

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Date of Birth:	1992 (Helsinki, Finland)
Date of CV:	August 2020

Education & Employment

9/2020 – **Postdoctoral fellow (sponsor: Joel Kamnitzer)**, *University of Toronto*

7/2019 – 8/2020 **Olga Taussky and John Todd Instructor in Mathematics**, *California Institute of Technology.*

9/2015 – 6/2019 **PhD**, Mathematics, *University of California, Davis.*

2 – 3/2017 **Visiting researcher**, *Institut Henri Poincaré.* Participant in the program *Combinatorics and Interactions.*

1 – 6/2014 **MSc**, Engineering Physics (Major: Pure Mathematics), *Aalto University.*

9/2012 – 1/2014 **BSc**, Engineering Physics (Major: Pure Mathematics), *Aalto University*

9/2012 – **Licentiate of Medicine** (Completed some coursework towards the degree), *University of Helsinki*

Scientific/Academic honors and grants

2020	The Finnish Academy of Science and Letters grant (10,000e for postdoctoral research)
2016 – 2019	The Vilho, Yrjö and Kalle Väisälä Foundation of the Finnish Academy of Science and Letters grant (25,000e yearly grant for graduate studies)
2015 – 2018	Departmental fellowship, UC Davis
2015 – 2020	ASLA-Fulbright Graduate Grant (15,000$ grant for graduate studies in the US)
2014	Aalto University fast graduation award (for completing a BSc+MSc in < 2 years)
2010 – 2012	International Chemistry Olympiad, three medals (2 bronze, 1 silver)

Publications

Papers

1. **Quadratic ideals and Rogers-Ramanujan recursions** (with Yuzhe Bai and Eugene Gorsky), *The Ramanujan Journal* (2018): 1-23.
2. **Hecke correspondences for Hilbert schemes of reducible locally planar curves**, *Algebraic Geometry (Foundation Compositio Mathematica)* 6.5 (2019).
3. **Unramified affine Springer fibers and isospectral Hilbert schemes**, *Selecta Mathematica (New Series)* 26, 61 (2020).

Preprints

1. **Generalized affine Springer theory and Hilbert schemes on planar curves** (with Niklas Garner). Submitted.
2. **The sheaf/affine Springer fiber correspondence** (with Eugene Gorsky and Alexei Oblomkov). Available on request.
3. **Computations for binomial edge ideals and Koszul duality**, December 2014. Available at arXiv:1412.3542.

Book chapters and manuscripts

1. **Proof of the Hard Lefschetz Theorem** (with Gurbir Dhillon), 2018. Chapter 18 of *Soergel bimodules*, to appear in the *RSME Springer Series*.

Theses

1. **Affine Springer fibers, Hilbert schemes and knots** PhD Thesis, UC Davis, 2019, 104 pages.
2. **Koszul algebras and resolutions** Master Thesis, Aalto University, 2014, 45 pages.
3. **Steady states in chemical reaction networks** Bachelor Thesis, Aalto University, 2014, 20 pages.

Articles in progress

1. **Global Springer theory for Coulomb branches of $3d\mathcal{N} = 4$ theories**
2. **Shift bimodule from affine Springer theory** (with Pablo Boixeda Alvarez and Ivan Losev).

Teaching experience

Caltech

Spring 2020	Instructor for the course *Topics in representation theory* (Math 145b).
Fall 2019	Instructor for the course *Algebraic geometry I* (Math 130a).

UC Davis

Fall 2018	Instructor for the course *Calculus* (Math 21A).
Fall 2016	TA for the course *Algebra* (Math 150A).
Spring 2016	TA for the courses *Calculus III* (Math 21C) & *Ordinary differential equations* (Math 22B).
Fall 2015	TA for the course *Calculus I* (Math 21A).

Aalto University

Fall 2014–Spring 2015	Department head TA & calculus room coordinator.
Fall 2014	TA for the course *Combinatorics* (MSc level).
Spring 2014	TA for the courses *Partial Differential Equations*, *Calculus IV*, *Linear Algebra*.
Fall 2013	TA for the courses *Calculus I-III*.

Seminar talks and lectures

2020 Feb.	**Triply graded homology of algebraic links and affine Springer theory** ICERM workshop "Soergel bimodules and categorification of the braid group". (Video available on the ICERM website).
—— Mar.	**Generalized affine Springer theory and homology of algebraic braids**. University of Vienna, representation theory and automorphic forms seminar.
—— Jun.	**$\mathbb{Z}$-algebras from Coulomb branches**. Perimeter Institute/MPIM Bonn, Geometric Representation Theory twinned conference . (Video available on the PI website).
2019 Feb.	**Commutative algebra related to some affine Springer fibers** Caltech, algebra & geometry seminar.
—— Mar.	**Commutative algebra related to some affine Springer fibers** MIT, geometric representation theory seminar.
2018 Nov.	**Lusztig-Yun theory in type A** UC Davis, algebraic geometry seminar.

—— Oct. **Hecke correspondences on Hilbert schemes of singular plane curves and knot homology** Johns Hopkins, algebraic geometry seminar.
—— Oct. **Unramified affine Springer fibers and isospectral Hilbert schemes** University of Michigan, AMS sectional meeting.
—— Sep. **Hilbert schemes and affine Springer fibers** Center for Quantum Geometry of Moduli spaces (QGM), Aarhus, QGM Seminar.
—— Jul. **Unramified affine Springer fibers and isospectral Hilbert schemes** (poster presentation). IST Austria, summer school on geometric representation theory.
—— Apr. **Springer theory for symmetric spaces in type A** Northeastern University, AMS sectional meeting.
—— Mar. **Knots, Hilbert schemes and affine Springer fibers** University of Chicago, algebraic geometry seminar.
—— Feb. **Quantization of symplectic resolutions** UC Davis, representation theory seminar.
—— Feb. **Hilbert schemes of reducible locally planar curves and Khovanov-Rozansky homology** MSRI, Enumerative geometry beyond numbers postdoc/student seminar.
2017 Dec. **Algebraic geometry and knot homologies** Aalto University.
—— Nov. **Algebra actions on homology of Hilbert schemes** UC Davis, representation theory seminar.
—— May **Positivity of LLT and Macdonald polynomials, after Grojnowski-Haiman** UC Davis, representation theory seminar.
—— Apr. **Hilbert schemes of points on locally planar curves** UC Davis, qualifying exam talk.
2016 Oct. **Haiman's proof of the $n!$ and $(n+1)^{n-1}$ conjectures using Hilbert schemes** UC Berkeley, Macdonald polynomials seminar.
—— Apr. **Geometric Langlands for opers after Beilinson-Drinfeld** UC Davis, variation of Hodge Structures, WKB analysis, and quantization seminar course.
—— Feb. **Divisors and line bundles on toric varieties** UC Davis, toric varieties reading seminar.
2015 Nov. **Knizhnik-Zamolodchikov functors for rational Cherednik algebras** UC Davis, representation theory seminar.
2014 Dec. **Koszul algebras and their identification** Aalto University, combinatorics seminar.

Seminars (co-)organized

2019-2020 Main organizer of the Caltech Algebra & Geometry seminar.
2018 Fall Reading seminar on mixed Hodge polynomials of wild character varieties.
2018 Spring Reading seminar on noncommutative geometry of the quantum Hall effect (at UC Davis, with Eric Babson, Jerry Kaminker and Alvin Moon)
2017 Fall Knot homology seminar (at UC Davis, with Beibei Liu)
2017 Fall Student algebraic geometry seminar (at UC Davis, with Priya Kshirsagar)
2017 Spring Reading seminar on polygraphs and Macdonald polynomials (at UC Davis/UC Berkeley, with Maria Gillespie)
2016 Fall Reading seminar on combinatorial Hodge theory (at UC Davis, with Federico Castillo and Lang Mou)
2016 Spring Reading seminar on toric varieties (at UC Davis, with Federico Castillo)
2014 Spring Reading seminar on higher categories (at Aalto University, with Emanuele Ventura)

Professional activities

2019-2020	Reviewed graduate applications for the math department at Caltech.
2019-2020	On the candidacy committee of Konrad Pilch (Caltech).
2018-	Reviewer for zbMATH and MathSciNet

Conferences and workshops

2019 Jul.	String-math 2019, Uppsala University
2018 Oct.	AMS Central Sectional Meeting, University of Michigan
2018 Oct.	Categorified Hecke Algebras, Hilbert Schemes and Link Homology, AIM
2018 Aug.	WARTHOG 2018: Deligne-Lusztig Theory, University of Oregon
2018 Jul.	Summer School on Geometric Representation Theory, IST Austria
2018 Jun.	CIME School on Geometric Representation Theory and Gauge Theories, Cetraro
2018 Jun.	Southeastern Lie Theory Summer School, UGA
2018 May	Representation Theory, Geometry and Quantization (Kostant Memorial Conference), MIT
2018 May	Alexander Givental 60th Birthday Conference, UC Berkeley
2018 Apr.	AMS Northeastern Sectional Meeting, Northeastern University
2018 Jan.-May	Enumerative Geometry Beyond Numbers, MSRI
2017 Nov.	AMS Western Sectional Meeting, UC Riverside
2017 Aug.	WARTHOG 2017: Koszul duality for Higgs and Coulomb branches, University of Oregon
2017 Jul.	String-Math 2017, University of Hamburg
2017 Jun.	Summer School on Soergel Bimodules, MSRI
2017 Jun.	Workshop on Algebraic Geometry and Physics, SISSA
2017 Apr.	Scholze lectures on p-adic geometry, IHÉS
2017 Mar.	Workshop on Enumerative Geometry, Institut Henri Poincaré
2016 Nov.	Workshop on Hall Algebras, Enumerative Geometry and Gauge Theory, the Fields Institute
2016 Oct.	Workshop on Singularities and Motivic Integration, UC Davis
2016 Jul.	WARTHOG 2016: Hilbert Schemes, Knot Homologies and Cherednik Algebras, University of Oregon
2016 Dec.	Center for Quantum Mathematics and Physics Inaugural Conference, UC Davis
2016 Jun.	String-Math 2016, Collège de France
2015 Mar.	John Coates 70th Birthday Conference, Cambridge
2014 Nov.	Categorical Structures in Harmonic Analysis, MSRI
2014 Jun.	Antti Kupiainen 60th Birthday Conference, University of Helsinki
2014 Mar.	Applications of Real Algebraic Geometry, Aalto University
2013 Jun.	Summer School on Algebraic Statistics, Nordfjordeid

Skills

Languages	Finnish (native), English (fluent), Swedish (good), French (good), Spanish (conversational)
Computer	Scala, Python, C, MATLAB, Macaulay2, Sage, Mathematica, Maple, LaTeX

References

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