

Gabriel C. Drummond-Cole

Curriculum Vitae

Education

- 2010 **PhD**, *City University of New York*.
- 2010 **MPhil**, *City University of New York*.
- 2003 **BA**, *University of California, Berkeley*.

PhD thesis

- Title *Homotopy Batalin-Vilkovisky algebras, trivializing circle actions, and moduli space*
- Advisor John Terilla

Employment

- 2013–2019 **IBS Fellow**,
IBS Center for Geometry and Physics (IBS-CGP), Pohang (Republic of Korea).
- 2010–2013 **NSF postdoctoral research fellow and Ralph P. Boas assistant professor**,
Northwestern University, Evanston (Illinois).

Publications and preprints

Publications

- 2020 (with B. H. An and B. Knudsen). *Edge stabilization in the homology of graph braid groups*. *Geom. Topol.* **24** (1), 421–469.
- 2019 (with J. Hirsh and D. Lejay). *Endomorphisms are adjoint to representations*. *J. Homotopy Relat. Struct. Online First*, 17 pages.
- (with P. Hackney). *A criterion for existence of right-induced model structures*. *Bull. London Math. Soc.* **51** (2), 309–326.
- (with B. H. An and B. Knudsen). *Subdivisional spaces and graph braid groups*. *Doc. Math.* **24**, 1513–1583.
- 2018 *An operadic approach to operator-valued free cumulants*. *Higher Structures* **2** (1), 42–56.
- *A non-crossing word cooperad for free homotopy probability theory*. *MATRIX Book Series* **1**, 77–99.
- 2017 (with B. Knudsen). *Betti numbers of configuration spaces of surfaces*. *J. London Math. Soc.* **96** (2), 367–393.
- (with J. Terilla). *Homotopy probability theory on a Riemannian manifold and the Euler equation*. *New York J. Math.* **23**, 1065–1085.

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- 2016 (with J. Hirsh). *Model structures for coalgebras*. Proc. Amer. Math. Soc **144**, 1467–1481.
- 2015 (with J.-S. Park and J. Terilla). *Homotopy probability theory I*. J. Homotopy Relat. Struct. **10** (3), 425–435.
- (with J.-S. Park and J. Terilla). *Homotopy probability theory II*. J. Homotopy Relat. Struct. **10** (3), 623–635.
- 2014 *An update on domineering on rectangular boards*. Integers **14**, 13 pages.
- *Formal formality of the hypercommutative algebras of low dimensional Calabi-Yau varieties*. Comm. Math. Phys. **327** (2), 433–441.
- *Homotopically trivializing the circle in the framed little disks*. J. Topol. **7** (1), 641–676.
- 2013 (with B. Vallette). *The minimal model for the Batalin–Vilkovisky operad*. Selecta Math. (N.S.) **19** (1), 1–47.
- 2010 (with J. Terilla and T. Tradler). *Algebras over $\Omega(\text{coFrob})$* . J. Homotopy Relat. Struct. **5** (1), 15–36.
- 2009 (with D. O’Donnol). *Intrinsically n -linked complete graphs*. Tokyo J. Math. **32**, 113–125.
- 2005 *Positions of value $*2$ in generalized domineering and chess*. Integers **5** (1), 13 pages.

Preprints

- 2019 (with M. Tavakol). *An action of the Polishchuk differential operator via punctured surfaces*. Accepted, Int. Math. Res. Not. IMRN, 37 pages.
- (with J. Hirsh and D. Lejay). *Endomorphism operads of functors*. arXiv:1906.09006, 20 pages.
- (with P. Hackney). *Coextension of scalars in operad theory*. arXiv:1906.12275, 39 pages.
- *Betti numbers of unordered configuration spaces of small graphs*. arXiv:1906.00692, 728 pages.
- (with G. Horel). *Homotopy transfer and formality*. arXiv:1906.03475, 20 pages.
- 2018 (with P. Hackney). *Dwyer–Kan homotopy theory for cyclic operads*. arXiv:1809.06322, 25 pages.
- 2015 (with K. Poirier and N. Rounds). *Chain level string topology operations*. arXiv:1506.02596, 67 pages.
- 2014 (with J. Terilla). *Cones in homotopy probability theory*. arXiv:1410.5506, 8 pages.
- 2004 *Temperature two in domineering*. Unpublished note, 2 pages.

Teaching Experience

POSTECH

Spring 2018 Homological algebra

Northwestern University

Spring 2013 Introduction to Game Theory

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Fall 2012	Differential Calculus of Multivariable Functions	<i>two sections</i>
Spring 2011	Introduction to Game Theory	<i>redesigned course and wrote new text</i>
Winter 2011	Differential Calculus of Multivariable Functions	
	Algebraic Topology	<i>independent study</i>
Fall 2010	Integral Calculus of One Variable Functions	
	Lehman College	
Spring 2010	College Algebra	
	Problem Solving for Management, Economics, and Life Sciences	
	Differential Calculus	<i>two sections</i>
Fall 2009	College Algebra	<i>two sections</i>
	Precalculus	
	Integral Calculus	
	Baruch College	
Spring 2009	Applied Calculus	
Fall 2008	Precalculus	<i>two sections</i>
	Stony Brook University	
Fall 2007	Differential Calculus	<i>large lecture</i>
Summer 2005	Differential Calculus	
Spring 2005	Functions	
2003–2008	Various	<i>Teaching assistant, seven courses</i>
2004–2008	Various	<i>Grader, six courses</i>
	Other	
2000–2009	Various	<i>Private tutor</i>

Talks and Presentations

Lecture series

2018	Homotopy Probability Theory, Sichuan University (China)	<i>Three lectures</i>
2016	Model Categories, KIAS (Republic of Korea)	<i>Three lectures</i>
2013	Operadic Algebra, IBS-CGP (Republic of Korea)	<i>Three lectures</i>
2011	Summer school on string topology, UC Berkeley	<i>Seven lectures</i>

Invited Talks

2018	Topology Seminar, Stockholms universitet	
	Geometry and Topology Seminar, UC Irvine	
2017	Australian Category Seminar, Macquarie University (Sydney)	
	AG Topologie Seminar, Freie Universität Berlin	
	Homotopy Probability Theory Workshop, Universität des Saarlands (Saarbrücken)	
2016	Winter School on Higher Categories and TQFT, KIAS (Seoul)	
	Einstein chair seminar, CUNY	

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- Topology seminar, Massachusetts Institute of Technology (Cambridge)
 Deformation theory seminar, University of Pennsylvania (Philadelphia)
 Topology seminar, University of Indiana (Bloomington)
 Topology seminar, University of Illinois (Urbana-Champaign)
 AMS Sectional meeting: Topology and physics session, University of Saint Thomas (Minneapolis)
 Higher Structures: Advances, MATRIX (Creswick)
 Colloquium, Yonsei University (Seoul)
- 2015 Einstein chair seminar, CUNY
 East Asian Symplectic Conference, CUHK
 Topology seminar, UC Berkeley
 Topology seminar, Stanford University
- 2014 IBS Research Conference, Daejeon convention center
 Géométrie Algébrique, Champs et Homotopie Seminar, Institut de Mathématiques de Toulouse
- 2012 Special guest lecture, IBS-CGP (Pohang)
 Topology seminar, University of Indiana (Bloomington)
 Topology seminar, University of Illinois (Urbana-Champaign)
 Topology seminar, UC Berkeley
- 2011 Topology seminar, University of Chicago
 Topology seminar, Purdue (West Lafayette)
- 2010 Workshop: Topology and Quantization, UC Berkeley
- 2009 Workshop: Strings, Fields, and Topology, Mathematisches Forschungsinstitut Oberwolfach

Other Professional Activities

Organization

- 2020 **Organizer**, *Configuration spaces of graphs*, AIM.
- 2019 **Organizer**, *Current directions in homotopical algebra*, IBS Center for Geometry and Physics.
- 2018 **Organizer**, *Pohang Operadic Workshop*, IBS Center for Geometry and Physics.
Organizer, *Topology in Australia and South Korea*, IBS Center for Geometry and Physics.
- 2017 **Organizer**, *Topology in Australia and South Korea*, University of Melbourne.
- 2016 **Organizer**, *String topology mini-workshop*, IBS Center for Geometry and Physics.
Organizer, *Paired workshops on string field theory of the B model and homotopical methods in quantum field theory*, IBS Center for Geometry and Physics.
- 2011 **Organizer**, *Summer school on string topology*, UC Berkeley.
Organizer, *Koszul duality for operads seminar*, Northwestern University.

Thesis committees

2018 **Committee member**, *Taesu Kim*, Seoul National University.

Course design

2011 **Developer**, *New undergraduate course on combinatorial game theory, including new textbook*, Northwestern University.

Computer-related

2003–present Compile and maintain extensive notes in \LaTeX of many conferences, seminars, workshops, and courses, available on my web page

2006–2008 Coded websites and internal scripts for Stony Brook Mathematics departmental staff and Research Training Group

2006 Compiled and edited official course notes for Park City/IAS Summer School on low dimensional topology