

Octav Cornea: Curriculum Vitae ¹

*Date and place of birth: July 15th, 1966, Bucharest, Romania
Canadian Citizen*

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Positions held:

2015-2016. Member, *Institute for Advanced Study, Princeton.*
2010 - current. Director, *Séminaire de Mathématiques Supérieures.*
2003 - current. Professor, Université de Montréal.
2011 - 2014. Deputy Director, *Centre de recherches mathématiques.*
Fall 2009. Research Professor, *Mathematical Sciences Research Institute, Berkeley.*
2006 - 2009. Director, *Institut de Sciences Mathématiques de Montréal.*
2000-2001. Member of the CNRS (délégation).
1994 - 2003. Professeur des Universités, Lille 1, France.
1993 - 1994. Postdoctoral fellow, University of Toronto.
1990 - 1993. Teaching Assistant, University of Rochester.

Educational background:

Ph.D. - University of Rochester 1993, advisor Joseph Neisendorfer.
M.A. - University of Rochester 1992.
B.A. - University of Bucharest 1990.

Research interests:

Symplectic, algebraic and differential topology.

¹Date: September 2016

Distinctions and prestigious invitations

- Member, *Institute for Advanced Study*, (2015-2016).
- Simons Fellow (2015-2016).
- Invited Speaker: *Mathematical Congress of the Americas*, August 2013.
<http://www.mca2013.org/en/programme/invited-speakers.html>
- Invited Speaker: *D-Days, A panorama of Geometry*, ETH, June 2013.
<http://www.fim.math.ethz.ch/conferences/2013/>.
- Research Professor MSRI. Fall 2009.
- Plenary Speaker *AMS - sectional meeting*, April 2009.
- Invited plenary speaker (joint with P. Biran), *Yashafest*, June 2007.

Students and post-doctoral fellows.

Post-doctoral fellows:

- Sarah Tukachinsky (2016-2017, co-supervision)
- Weivei Wu (2014-2016, co-supervision)
- Luis Haug (2014-2016, co-supervision)
- Michael Brandenbursky (2013-2015, co-supervision)
- Egor Shelukhin (2012-2015, co-supervision)
- Yasha Savelyev (2011-2013, co-supervision)
- Roman Golovko (2010-2012, co-supervision)
- Nicolai Dimitrov (2009-2010, co-supervision)
- Martin Pinsonneault (2007-2008, co-supervision)
- Shengda Hu (2007-2008, co-supervision)
- Ozgur Ceyhan (2006-2008, co-supervision)
- Basak Gurel (2006-2008, co-supervision)
- Samuel Lisi (2005-2007, co-supervision)
- Alex Ivrii (2003-2004, co-supervision)

Doctoral students:

- Alexandre Perrier (January 2015 -)

- Emily Campling (January 2014 -)
- Alex Provost (September 2014 -)
- Vincent Letourneau (September 2014 -, co-supervision).
- Lara-Simone Suarez Lopez (2014).
- François Charest (2012, co-supervision).
- François Charette (2012).
- Anthony Rieser (2010).
- Fabien Ngo (2010, co-supervision)
- Rémi Leclercq (2007).
- Pierre-Marie Moyaux (2001).

Master/DEA students:

- Audrey Morin (September 2014 -).
- Florian Duquerroix (September 2012 - September 2014).
- Vincent Letourneau (January 2013 - September 2014).
- Tuan Nguyen (2011-2013, co-supervision).
- Alexandre St.Pierre (2007-2009).
- François Charette (2005-2007).
- Olivier Rousseau (2003-2005).
- François Rose (1997).
- Benoit Trouillet (1997).
- Pierre-Marie Moyaux (1996).
- Stephane Zamparo (1996).

Fellows:

- Alexis Leroux-Lapierre (summer 2016)
- Stephanie Larocque (summer 2015)
- Francois Simon Fauteux-Chapleau (summer 2014 and summer 2015)
- Alexandre Perrier (ENS - stage Master 2, printemps 2014)

- Vincent Girard (summer 2014)
- Jean Lagacé (summer 2013)
- Audrey Morin (summer 2103).
- Vincent Letourneau (summer 2012).
- Audrey Morin (summer 2012).
- Jean-François Viens (summer 2011 and 2012).
- Jean-François Gagnon (summer 2009).
- Esteban Herrera (summer 2008).
- Loic Seguin-Charbonneau (summer 2007).
- Pierre Pageault (summer 2006).
- Katja Hutschenreuter (summer 2005).
- François Charette (summer 2005).
- Daniel Fiorilli (summer 2005).

Scientific committees and boards.

- Editor of the Journal of Fixed Point Theory and Applications (Birkhauser) (2007–2010, associate editor since 2010).
- Editor of the Annales Mathématiques du Québec (since 2009).
- Local scientific board of the CRM (2014 - 2016).
- Nominating Committee of the Canadian Mathematical Society (2011 - 2014).
- NSERC Discovery Grant Evaluation Group 1508 (maths - stats, 2009-2012).
- NSF Panel on geometric analysis and symplectic geometry, 2010.
- Banff International Research Station, Scientific Advisory Board (2005-2007).
- Canada Research Chairs Program College of Reviewers (since 2005).
- Board of directors of the Canadian Mathematical Society (2007-2011).
- European Research Council Experts Board - external member (2009-2013).

Grants.

- Simons Foundation, 126000\$ for 2015-2016.
- FRQ-NT - research team grant (with Francois Lalonde and Johannes Walcher). 41000\$/year, 2013-2016.
- NSERC - individual Discovery grant, 44000\$/year, 2013-2018.
- NSERC - Banff International Research Station support grant (Nassif Ghoussoub - principal applicant - and ten co-applicants), 636000\$/year, 2011-2016.
- FQRNT - group grant (with François Lalonde), 47000\$/year, 2010 -2013.
- NSERC - individual grant, 25000\$/year, 2008-2013.
- FQRNT - group grant (with Francois Lalonde). 48000\$/year, 2007-2010.
- NSERC - individual grant, 18000\$/year, 2003-2008.
- FQRNT - group grant (coordinator Steven Boyer), 40000\$/year, 2003-2006.
- NSERC - Leadership Science Initiative - group grant (coordinator Steven Boyer), 42000\$/year, 2003-2006
- NATO- Advanced Science Inst. -grant, 2004, 42000 euros.
- 1996-2002 recipient of “Prime de recherche et encadrement doctoral” (France).

Organization of scientific events.

- Summer school on symplectic topology, CIRM - Marseille, September 2015, (co-organizer).
- Symplectic Topology conference, CRM - Montreal, August 2015, (co-organizer).
- Special session on symplectic geometry, the Mathematical Congress of the Americas, Mexico, August 2013, (co-organizer).
- Conference on non-linear analysis and applications, the Banach Center, Poland, July 2013 (scientific committee member).
- J -holomorphic curves in symplectic geometry and topology, CRM, April -May, 2013 (co-organizer).
- Scientific co-director for the Canada - France joint mathematical meeting, Montreal, 2008.
- “Floer methods in dynamics”, CRM, 2008, (co-organizer).
- “Floer theory” meeting at BIRS, 2007, (co-organizer).
- Mini-conference of homotopy theory, CRM, November 18-20, 2005.

- Workshop on “Cluster-Polyfold theory” at the Institute for Advanced Study, October 2005, (co-organizer).
- CRM - ISM Colloquium in 2004-2005 (co-organizer) .
- Symplectic informal semester at the CRM, Fall 2004, (co-organizer).
- Nato Advanced Study Institute - “Morse Theoretical Methods in Symplectic Topology and Non-linear Analysis ” - june, 2004, (scientific co-director).
- Colloquium in Lille, Spring 2002.
- Conference on Symplectic Topology in Lille, June 2002, (co-organizer)
- Workshop on the Conley index , Sherbrooke, Quebec, August 2001, (co-organizer).
- AMS-SIAM Summer Research Conference on the Lusternik-Schnirelmann category and its applications, Mt. Holyoke, US, August 2001, (co-organizer).
- ”Journées de théorie de l’homotopie” 12-18 January 1997 at the Centre International de Rencontres Mathematiques (CIRM) in Luminy, France, (co-organizer).
- Mini-conference on the Conley index” at the University of Lille in March 1996.
- Annual series of lectures on “Homotopy theory and applications” from 1995 to 2000 at the University of Lille 1.

Long term scientific visits (at least two weeks).

- Simons Center, Stony Brook - three weeks in the Spring of 2014.
- Professeur invité - Université Paul Sabatier Toulouse - June 2013.
- IAS, Princeton, USA - two weeks March 2012.
- ETH, Mathematics Department, Zürich - two weeks July 2011.
- Professeur invité - Université Paul Sabatier de Toulouse - May 2010.
- ETH, Mathematics Department, Zürich - two weeks in January 2010.
- MSRI, Fall 2009.
- Tel Aviv University, two weeks in June 2009.
- ETH Mathematics Department, Zürich - December 2007.
- Department of Mathematics, Tel Aviv University - April 2005.
- Pisa, Centro di Giorgi - February 2005.
- Courant Inst. NY - April 2001.

- Fields Institute, Toronto - Symplectic semester, March 2001.
- University of Campinas, November 2001.
- Research in Pairs Program, Oberwolfach July 1999.
- Centre de Recerca Matematica, Barcelona - the homotopy semester, Spring 1998.
- The Fields Institute, Toronto -the homotopy year, 1996.
- Université de Lille 1, May 1994.

Selected invited talks.

- Workshop on symplectic and contact topology, Montreal, May 2016.
- Conference on symplectic topology and dynamics, Madrid, May 2016.
- Seminar talk, MIT, April 2016.
- Seminar talk, Stanford, April 2016.
- IAS/Princeton University symplectic topology seminar, September 2015.
- PIMS Symposium on Geometry and Topology, Vancouver, June 2015 (plenary speaker).
- Moduli spaces in symplectic topology and gauge theory, CIRM, Marseille, June 2015.
- Loop spaces and symplectic topology, Nantes, September 2014.
- Technical aspects in moduli spaces 2nd workshop, Simons Center for Mathematics and Physics, June 2014.
- Symplectic topology and Dynamical systems, Madrid, November 2013.
- Summer school on Symplectic Topology in Llagone, June 2013 - principal speaker.
- Holomorphic curves in low-dimensional and symplectic topology, Stanford, August 2012.
- Oberwolfach meeting on Dynamics and symplectic Topology, July 2012.
- Haifa conference on symplectic topology, June 2012.
- CIRM - Marseille conference on Algebraic Topology, June 2012.
- Ottawa conference on algebraic topology, May 2012.
- Seminar talk, Chicago University, December 2011.
- Colloquium, Waterloo University, September 2011.
- Dynamical Systems, Campinas, Brazil, May 2011 - plenary speaker.

- Geometry and Physics Conference, Fields Inst., May 2011.
- Symplectic Topology Workshop, Kyoto, February 2011.
- Geometric group theory, dynamics and symplectic topology, Oberwolfach, July 2010.
- Geometry Seminar, Toulouse, May 2010.
- Puzzles in symplectic geometry and topology, MSRI Berkeley, March 2010.
- Introductory workshop to the Symplectic Program, MSRI Berkeley, August 2009.
- CMS Summer meeting in St. John's, NF (sectional speaker), June 2009.
- Florida Topology Conference, March 2009 - semi-plenary invited speaker.
- Geometric group theory, dynamics and symplectic topology, Oberwolfach, September 2008.
- Indiana Symplectic Topology conference, Indianapolis, February 2008.
- Math-Physics conference, ETH, September 2007.
- Geometric group theory, dynamics and symplectic topology, Oberwolfach, July 2006.
- Computational and topological aspects of dynamics", Lorenz Center the Netherlands, May 2006.
- BIRS symplectic topology, December 2005.
- Conference on topology of manifolds, Siegen, July 2005.
- Colloquium, Technion, April 2005.
- Colloquium, Bar Ilan University, April 2005.
- Distinguished Topology lectures, Tel Aviv University, April, 2005.
- Mini-course on symplectic topology, Scuola Normale Sup.-Pisa, February 2005.
- NATO summer school, Montreal, July 2004.
- Meeting of the CMS - SMF - Toulouse, July 2004.
- AMS sectional meeting in Los-Angeles, April 2004.
- Colloquium University of Florida Gainesville, March 2004.
- AMS sectional meeting in Binghamton, October 2003.
- Non-linear analysis meeting in Bedlewo, Poland, June 2003.
- Canadian Math. Soc. meeting in Edmonton, June 2003.

- Colloquium, Dartmouth University, avril 2003.
- NYU-SUNY, Symplectic topology seminar, février 2003.
- Leipzig - Mini-course “Topology for the non-linear analyst”, November 2002
- Louvain-la-Neuve - Mini-course on “Morse theory”
- Oberwolfach, Topology conference, September 2001
- Barcelona Euro-PhD conference, Barcelona, July 2001
- Skye Algebraic Topology conference, Skye, June 2001
- Non-linear analysis, Banach Inst., Poland, June 2001
- Fields-CRM Symplectic Topology workshop, April 2001
- Algebraic topology meeting in Strasbourg, September 2000
- Algebraic topology workshop in Haifa, June 2000
- The AMS regional meeting in Charlotte (special session on Dynamical Systems), October 1999.
- Algebraic Topology, Paris, September 1999.
- 2nd International Conference on Topological Methods in non-linear Analysis, Guernavaca, Mexico, February 1999.
- Algebraic Topology, Angers, September 1998.
- Aarhus Topology and Geometry Conference, Aarhus, August 1998.
- Barcelona Algebraic Topology Conference, Barcelona, June 1998.
- Conference on the Conley index at the Banach center, Warsaw, June 1997.
- Conference on the LS-category at the Banach center, Warsaw, June 1997.
- The AMS regional meeting in Detroit, May 1997.
- Northwestern Homotopy Conference, Evanston, March 1997.
- Homotopy miniconference; Matagne la Petite, November 1996.
- The homotopy year at the Fields Institute; Toronto, May 1996 .
- Algebraic Topology Miniconference; Paris Nord, December 1995.
- AMS regional meeting at Kent State University; November 3-4, 1995.
- Topology; Oberwolfach, September 3-9, 1995.

- Modern trends in homotopy theory: Oxford, Spring 1995.
- Rational Homotopy Summer School at Breil sur Roya, France; May 24 - June 4, 1994.
- Ontario Topology conference, Toronto 1993.
- AMS conference Trent University, October 1993.
- Algebraic topology miniconference; Malaga, Spain, October 1993
- The AMS regional meeting in Syracuse, September 1993.
- The Cech Centennial Homotopy Conference; Northeastern University, June 1993.
- Algebraic Homotopy; Schloss Ringberg, Germany, April 1993.
- Ontario Topology conference; University of Rochester, April 1992.

Teaching.

I taught at all levels: calculus, complex analysis, general topology, algebraic topology, differential geometry and a variety of specialized advanced courses - Morse theory, Lagrangian topology etc. In the last few years I taught mainly topology courses at the Undergraduate and Graduate levels.

Administration.

- Since 2010, I am director of the *Séminaire de Mathématiques Supérieures* (<http://www.dms.umontreal.ca/sms/>). This is one of the oldest and better known summer schools in mathematics. This school takes place with the collaboration of four of the main mathematical research Institutes in North America (the CRM, the Fields Institute, PIMS and the MSRI).
- I was deputy director of the *Centre de Recherche Mathématiques* from 2011 to 2014. (<http://www.crm.umontreal.ca/en/index.shtml>).
- I was director of the *Institut de Sciences Mathématiques de Montréal* (<http://www.math.uqam.ca/ism/>) from 2006 to 2009.

Publication list.

Refereed papers, published or accepted:

31. with François Charette, Categorification of Seidel's representation, *Israel J. of Mathematics* 211 (2016), 67–104.
30. Lagrangian cobordism: Rigidity and Flexibility Aspects, *Mathematical Congress of the Americas, Contemp. Math.* 656, Amer. Math. Soc., Providence, RI, (2016), 41–63.
29. with Paul Biran, Lagrangian Cobordism and Fukaya categories, *GAF* 24 (2014), 1731–1830.

28. with Paul Biran, Lagrangian cobordism, *Journal of the A. M. S.*, 26 (2013), 295–340.
27. with Paul Biran, Enumerative geometry and Lagrangian topology, *Geometry and Topology*, 16 (2012), 963-1052.
26. with K. A. de Rezende, M.R. da Silveira - Spectral sequences in Conley's theory, *Ergod. Th. & Dynam. Sys.* (2010), 30, 1009–1054
25. with P. Biran - Rigidity and uniruling for Lagrangian manifolds, *Geometry and Topology* 13 (2009), 2881–2989.
24. with P. Biran - A Lagrangian Quantum Homology, *New Perspectives and Challenges in Symplectic Field Theory*, CRM Proceedings and Lecture Notes, 49 (2009), 1–44.
23. with Jean-François Barraud, Quantization of the Serre Spectral Sequence, *Journal of Symplectic Geometry*, 5 (2007), 249–280.
22. with Jean-François Barraud, Lagrangian intersections and the Serre spectral sequence, *Annals of Mathematics* 166 (2007), 657-722.
21. with François Lalonde, Cluster homology: an overview of the construction and results, *ERA AMS,12 (2006), 1-12.*
20. with Jean-François Barraud, Homotopical Dynamics in Symplectic Topology, in *Morse theoretical Methods in Non-Linear Analysis and Symplectic Topology*, Springer (2006) 109-148.
19. New obstructions to the thickening of CW complexes, *Proceedings of the American Mathematical Society* 132 (2004), 2769-2781.
18. with A. Ranicki - Rigidity and glueing for the Morse and Novikov complexes, *Journal of the European Mathematical Society*, 5 (2003), 343-394.
17. Homotopical Dynamics II: Hopf invariants, smoothings and the Morse complex, *Ann. Scient. Ec. Norm. Sup.* 35 (2002) 549–573
16. Homotopical Dynamics IV: Hopf invariants and Hamiltonian flows, *Communications on Pure and Applied Math.* 55 (2002), 1033–1088.
15. Homotopical Dynamics III: Real singularities and Hamiltonian flows, *Duke Mathematical Journal* 109 (2001) 183–204 .
14. Homotopical Dynamics: Suspension and Duality, *Ergodic Th. & Dyn. Systems* 20 - 2 (2000) 379–391.
13. avec Y.Felix et J.M.Lemaire - Rational Category and Cone-length of Poincaré Complexes, *Topology* 37 (1998) 743-748.
12. Cone-decompositions and degenerate critical points, *Proc. of the London Math. Soc.* 77 (1998) 437-461.

11. Spanier-Whitehead duality and critical points, Homotopy Theory via Algebraic Geometry and Group Representations, *AMS Contemp. Math.* 220 (1998) 47-63.
10. Some properties of relative L.S.-category, *Fields Inst. Commun.* 19, AMS (1998) 67-72.
9. Homotopical dynamics of gradient flows, Homotopy and Geometry, *Banach Center Publications*, 45 (1998), 41-46.
8. Strong L.S.-category equals cone-length, *Topology* 34 (1995) 377-381.
7. Lusternik-Schnirelmann categorical sections, *Ann.Scient.Ec.Norm.Sup.* 28 (1995) 689-704.
6. There is Just One Rational Cone-length, *Transactions of the A.M.S.* 4 (1994).
5. Cone-length and Lusternik-Schnirelmann category, *Topology* 33 (1994) 95-111.
4. The Genus and the Fundamental Group of High Dimensional Manifolds, *Stud.Cerc.Mat.* 4(1989).
3. Unele proprietati de separare ale hipersuprafetelor, *Stud.Cerc.Mat.* 4(1988).
2. Weak Discontinuities and Discrete Approximations, *An.Univ.Buch.* 3(1988).
1. Proprietati comune functiilor inchise si celor cu proprietatea lui Darboux, *Stud.Cerc.Mat.* 1(1987).

Books:

- A. Morse Theoretic Methods in Nonlinear Analysis and in Symplectic Topology Proceedings of the NATO Advanced Study Institute, NATO Science Series II: Mathematics, Physics and Chemistry, Vol. 217 Springer, 2006 (editor with Paul Biran and François Lalonde).
- B. “Lusternik-Schnirelmann category” (with John Oprea, Greg Lupton and Daniel Tanré) 320 pages, AMS Surveys and Monographs Series 2003.
- C. “Lusternik-Schnirelmann category in the new Millenium” (editor with John Oprea, Greg Lupton and Daniel Tanré) AMS Contemporary Math. 316 - 2002.

Preprints:

- i.4 with Egor Shelukhin, Lagrangian cobordism and metric invariants, preprint 2015, arXiv:1511.08550, 39 pages.
- i.3. with Paul Biran, Lagrangian cobordisms in Lefschetz fibrations, preprint 2015, arXiv:1504.00922, 109 pages.
- i.2. with Paul Biran, Quantum structures for monotone Lagrangians, preprint 2007, arXiv:0708.4221v1, 193 pages.

- i.1. with François Lalonde, Cluster Homology, preprint September 2005, arXiv:math/0508345, 57 pages.

Non-refereed publications:

- ii.4. Towards categorification of Lagrangian topology, *Oberwolfach Reports*, 9 (2012).
- ii.3. Lagrangian submanifolds: their fundamental group and Lagrangian cobordism, *Oberwolfach Reports*, 7 (2010).
- ii.2. Rigidity of Lagrangian Submanifolds, *Oberwolfach Reports*, 5 (2008).
- ii.1. Towards quantization of the Morse complex, *Oberwolfach Reports*, 3 (2006).