

WILLIE WAI-YEUNG WONG

Contact information

Address: EPFL SB MATHAA PDE
 Bâtiment MA
 Station 8
 CH-1015 Lausanne, Switzerland
Phone: +41 78 612 55 58
E-mail: willie.wong@epfl.ch
Webpage: <http://people.epfl.ch/willie.wong>

Education

2009 Ph.D. in Mathematics, Princeton University, Princeton, NJ
Dissertation advisor: Sergiu Klainerman
Dissertation title: On the uniqueness of Kerr–Newman black holes
 2005 B.A. with High Honors in Mathematics, Princeton University, Princeton, NJ

Research interests

Evolutionary partial differential equations and systems: Local well-posedness of the initial value problem, dynamical stability and unique continuation properties of stationary solutions, formation of shocks, geometric structure of singularities.
Mathematical general relativity: Uniqueness of black holes, stability of exact solutions, global structure of space-time.

Professional history

2011–present Post-doc collaborateur scientifique
 École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland
 2009–2011 Postdoctoral research associate
 DPMMS, University of Cambridge, Cambridge, United Kingdom
 2002, 2003 Energy Research Undergraduate Laboratory Fellow in atomic physics,
 Chemistry Division, Argonne National Laboratory, Argonne, Illinois, USA

Teaching experience*Instructor*

Mat202 Linear Algebra with Applications / Princeton University Spring 2008
 Taught one section of the course and then co-wrote and administered quizzes and exams.

Guest Instructor

Partial Differential Equations / CCA, University of Cambridge October/November 2010
 Lectured on introduction to Sobolev spaces. Lecture notes available at <http://people.epfl.ch/willie.wong>

Teaching Assistant

Géométrie (GC) / École Polytechnique Fédérale de Lausanne Spring 2014
 Head assistant: prepared and ran exercise sessions and examinations. Course covers basic differential geometry of curves and surfaces.

- Mathématiques Générales / University of Lausanne Fall 2013
 Head assistant: performed organisational duties for the course as well as ran group exercise sessions. Course covers basic probability and statistics, and differential and integral calculus in one variable.
- Géométrie (EL/MX) / École Polytechnique Fédérale de Lausanne Spring 2013
 Head assistant: prepared and ran exercise sessions and examinations. Course covers basic differential geometry of curves and surfaces.
- Mathématiques Générales / University of Lausanne Fall 2012
 Ran group exercise sessions. Course covers basic probability and statistics, and differential and integral calculus in one variable.
- Part II Differential Geometry / University of Cambridge Lent term 2011
 Ran supervisions (small group review sessions with two students each time).
- Mat451 Topics in Analysis: Introduction to General Relativity / Princeton University Spring 2009
 Assigned and evaluated student work, and provided office hours.
- Mat433 Special Topics in Analysis / Princeton University Fall 2008
 Evaluated student work and provided office hours.
- RTG Summer School in Analysis and Geometry / Princeton University Summers 2007, 2008
 Taught afternoon recitations, ran problem sessions, and assigned and evaluated student work.
- Program in Analysis and General Relativity / Peking University, Beijing, China April 2007
 Taught recitations and evaluated student work.

Honors and awards

- Phi Beta Kappa, inducted 2005
 US National Science Foundation Graduate Research Fellowship, 2005-2008
 International Physics Olympiad, Gold medal, 2001

Papers and preprints

- WWY Wong. "Stability and instability of expanding solutions to the Lorentzian constant-positive-mean-curvature flow". *Submitted* (2014) arXiv: 1404.0223.
- R Donninger, J Krieger, J Szeftel, and WWY Wong. "Codimension one stability of the catenoid under the vanishing mean curvature flow in Minkowski space". *Submitted* (2013) arXiv: 1310.5606.
- WWY Wong. "A comment on the construction of the maximal globally hyperbolic Cauchy development". *J. Math. Physics* 54:113511 (2013) arXiv: 1310.1318.
- J Krieger and WWY Wong. "On type I blow up formation for the critical NLW". *Comm. PDE* (Online, 2013) DOI: 10.1080/03605302.2013.861847; arXiv: 1301.4378.
- WWY Wong and P Yu. "Non-existence of multiple-black-hole solutions close to Kerr–Newman". *Comm. Math. Physics* 325:965–996 (2014) arXiv: 1210.1379.
- WWY Wong. "A positive mass theorem for two spatial dimension". *Pre-print* (2012) arXiv: 1202.6279.
- WWY Wong. "Regular hyperbolicity, dominant energy condition and causality for Lagrangian theories of maps". *Class. Quantum Grav.* 28:215008 (2011) arXiv: 1011.3029.
- GW Gibbons, CM Warnick, and WWY Wong. "Nonexistence of Skymion–Skymion and Skymion–anti-Skymion static equilibria". *J. Math. Phys.* 52:012905 (2011) arXiv: 1005.2488.

- WWY Wong and P Yu. “On strong unique continuation of coupled Einstein metrics”. *Int. Math. Res. Notices* 2012:544–560 (2012) arXiv: 0904.0465.
- WWY Wong. “A space-time characterization of the Kerr–Newman metric”. *Ann. Henri Poincaré* 10:453–484 (2009) arXiv: 0807.1904.
- MT Huang, WWY Wong, M Inokuti, SH Southworth, and L Young. “Triple ionization of Lithium by electron impact”. *Phys. Rev. Lett.* 90:163201 (2003).

Invited talks

- Analysis seminar*, EPFL, Lausanne, Switzerland. April 11, 2014.
- Mini-course for the *OXPDE Workshop on Nonlinear Wave Equations and General Relativity*, University of Oxford, Oxford, United Kingdom. January 13 & 14, 2014. (with G. Holzegel)
- OXPDE seminar*, University of Oxford, Oxford, United Kingdom. November 11, 2013
- Seminar as part of the *Mathematical General Relativity* semester program, MSRI, Berkeley, California, USA. September 5, 2013
- Geometry and analysis seminar*, Imperial College London, London, United Kingdom. March 21, 2013
- Gravitational physics seminar*, University of Vienna, Vienna, Austria. December 5, 2012
- Partial differential equations seminar*, EPFL, Lausanne, Switzerland. April 1, 2011
- Mathematical general relativity seminar*, LJLL, Université Pierre et Marie Curie, Paris, France. March 21, 2011
- Analysis seminar*, University of Birmingham, Birmingham, United Kingdom. March 2, 2011
- Analysis seminar*, University of Edinburgh, Edinburgh, United Kingdom. February 7, 2011
- Mathematical physics seminar*, University of Cambridge, Cambridge, United Kingdom. February 1, 2011
- Geometric analysis and PDE seminar*, University of Cambridge, Cambridge, United Kingdom. November 29, 2010
- Mathematical Relativity Workshop*, ICMS, Edinburgh, United Kingdom. September 2, 2010
- Relativity and cosmology seminar*, Queen Mary University of London, London, United Kingdom. May 12, 2010
- Relativity seminar*, University of Oxford, Oxford, United Kingdom. March 9, 2010
- Special session on general relativity and related partial differential equations*, AMS Fall Southeastern Meeting, Florida Atlantic University, Boca Raton, Florida. October 30, 2009

Conferences organized

- Special session on the mathematical challenges of relativity* co-organizer, Joint Mathematics Meetings, San Francisco, California. January 13–16, 2010. (with P. Allen, M. Eichmair, G. Holzegel, and J. Speck)
- Mathematical challenges of general relativity* working group co-moderator, AMS Mathematical Research Communities program, Snowbird, Utah. June 13–19, 2009. (with G. Holzegel)

Seminars organized

- Geometric analysis and PDE seminar*, University of Cambridge. 2010–2011
- Mathematical GR student seminar* with J. Speck and V. Schlue, University of Cambridge. 2009–2011
- PDE study group*, Princeton University. 2007–2009

Service

Referee for *Selecta Mathematica*, *Proceedings of the Royal Society A*, *Acta Applicanda Mathematicae*, *Journal of Differential Geometry*, *Journal of Partial Differential Equations*, *Discrete and Continuous Dynamical System – A*, *Proceedings of the American Mathematical Society*, *AMS Notices*, and *Mathematical Research Letters*.

Regular contributor to *Mathematical Reviews/MathSciNet*.

Moderator for the Mathematics Stack Exchange (<http://math.stackexchange.com/>) discussion forum.

Professional organization

American Association for the Advancement of Science, through the AAAS/Science Program for Excellence in Science, 2009–2011

American Mathematical Society, 2005–present

Sigma Xi, 2005–present

List of potential referees

Sergiu Klainerman, Princeton University (seri@math.princeton.edu)

Mihalis Dafermos, University of Cambridge and Princeton University (M.Dafermos@dpms.cam.ac.uk)

Joachim Krieger, EPFL (joachim.krieger@epfl.ch)