LAN-HSUAN HUANG

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CONTACT INFORMATION

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PERSONAL INFORMATION

Taiwanese Citizen. US Permanent Resident.

RESEARCH INTERESTS

Differential geometry, partial differential equations, and general relativity

EMPLOYMENT

Columbia University **August 2009-present**

Ritt Assistant Professor
Department of Mathematics

EDUCATION

Stanford University **2004-June 2009**

- Ph.D. in Mathematics
- Thesis topic: Center of Mass and Constant Mean Curvature Foliations for Isolated Systems
- Advisor: Professor Richard Schoen

National Taiwan University **2000-2004**

B.S. in Mathematics

PUBLICATION LIST

1) **Spacetime positive mass theorem in dimensions less than eight**. (Joint with Michael Eichmair, Dan A. Lee, and Richard Scheon), arXiv:1110.2087v1 [math.DG], submitted.
2) **Geometric inequalities and rigidity theorems on equatorial spheres.** (Joint with Damin Wu) arXiv:1104.0406, submitted.
3) **Hypersurfaces with nonnegative scalar curvature.** (Joint with Damin Wu) arXiv:1102.5749, submitted.
4) **On the center of mass in general relativity.** Appeared in the Proceedings of Fifth International Congress of Chinese Mathematicians.
5) **Specifying angular momentum and center of mass for vacuum initial data sets.** (Joint with Richard Schoen and Mu-Tao Wang) Comm. Math. Phys. 306 (2011), no. 3, 785-803.
6) **Solutions of special asymptotics to the Einstein constraint equations.** Class. Quantum Gravity 27 (2010), no. 24, 245002 (10pp).
7) **Rigidity theorems on hemispheres in non-positive space forms.** (Joint with Damin Wu) Comm. Anal. Geom. 18 (2010), no. 2, 339-363.
8) **Foliations by stable spheres with constant mean curvature for isolated systems with general asymptotics**. Comm. Math. Phys. 300 (2010), no. 2, 331-373.
9) **On the center of mass of isolated systems with general asymptotics**. Class. Quantum Grav. 26 (2009) 015012 (25pp).

VISITING POSITIONS

- Max-Planck Institute for Gravitational Physics, Potsdam, Germany, September 15-October 15, 2010
- Institut Mittag-Leffler, Djursholm, Sweden, September 1-October 31, 2008

HONORS

- NSF grant "Geometric Problems in General Relativity" ($125,645) — 2010-2013
- AWM-NSF Travel Grant, to participate Eighth Joint International Meeting of the AMS and the Sociedad Matematica, Berkeley, CA, June 2-5, 2010 — October 2009
- Institut Mittag-Leffler Scholarship — Autumn 2008
- Mary V. Sunseri Graduate Fellowship at Stanford University — Summer 2007

- National Taiwan University Presidential Award — Autumn 2003
- Dr. Wu Chien-Shiung Memorial Prize — Summer 2000

SERVICES

- Organizer of General Relativity Seminar at Columbia (2009-present)
- Organizer of Stony Brook-Columbia Joint General Relativity Seminar (2010-2011)
- Journal Referee for Communications in Analysis and Geometry, Journal of Differential Geometry, and Pacific Journal of Mathematics
- Reviewer for Math Reviews

TEACHING EXPERIENCE AT COLUMBIA

- Fall 2009: Linear Algebra & Reading Class on General Relativity with an undergraduate student
- Spring 2010: Calculus I (two sections)
- Spring 2011: Calculus I & Calculus II
- Fall 2011: Calculus II (two sections)

TEACHING EXPERIENCE AT STANFORD (as a Recitation Instructor)

- Autumn 2005-2006: Math 51 Linear Algebra and Multivariable Calculus
- Winter 2006-2007: Math 51 Linear Algebra and Multivariable Calculus
- Winter 2007-2008: Math 52 Multivariable Integral Calculus
- Winter 2008-2009: Math 52 Multivariable Integral Calculus
- Spring 2008-2009: Math 53 Ordinary Differential Equations with Linear Algebra

INVITED TALKS

1) Several Lectures in Summer Graduate Workshop on Mathematical General Relativity at MSRI, July 9-20, 2012
2) 27^{TH} Annual Geometry Festival, Duke, April 27-29, 2012 (declined)
3) Duke University "*Positive mass theorems and scalar curvature problems*", February 13, 2012
4) University of Wisconsin-Madison, Colloquium "*Positive mass theorems and scalar curvature problems*", February 8, 2012

5) University of Wisconsin-Madison, PDE & Geometry Seminar *"Hypersurfaces with nonnegative scalar curvature"*, February 7, 2012
6) University of Connecticut, Colloquium "*Positive mass theorems and scalar curvature problems*", February 2, 2012
7) University of North Carolina at Chapel Hill, Colloquium "*Positive mass theorems and scalar curvature problems*", January 30, 2012
8) University of Minnesota, Colloquium "*Positive mass theorems and scalar curvature problems*", January 26, 2012
9) Johns Hopkins University, "*Positive mass theorems and scalar curvature problems*", January 23, 2012
10) University of Colorado at Boulder, Colloquium "*Positive mass theorems and scalar curvature problems*", January 17, 2012
11) Ohio State University Geometry and PDE Joint Seminar "*Spacetime positive mass theorem in dimensions less than 8*", November 8, 2011
12) MIT Geometric Analysis Seminar, October 19, 2011
13) University of Miami Geometry and Physics Seminar, October 12, 2011
14) Duke Geometry/Topology Seminar, September 21, 2011
15) AWM Anniversary Conference at ICERM: 40 Years and Counting: AWM's Celebration of Women in Mathematics "*Hypersurfaces with nonnegative scalar curvature*" in the special session on Riemannian Geometry, Brown University, September 17-18, 2011
16) Workshop on Differential Geometry "*Hypersurfaces with nonnegative scalar curvature*", Fudan University, Shanghai, China, June 27, 2011
17) Topology/Geometry Seminar "*Spacetime positive mass theorem in dimensions less than 8*", Capital Normal University, Beijing, China, June 23, 2011
18) Beijing Summer Program in Mathematical Relativity 2011 "*Hypersurfaces with nonnegative scalar curvature*", Beijing, China, June 6-25, 2011
19) Fifth International Conference on Complex Analysis & Dynamical Systems, Palm Beach Hotel, Akko (Acre), Israel, May 22-27, 2011
20) Lafayette-Lehigh Geometry/Topology Seminar "*Hypersurfaces with nonnegative scalar curvature*", Lafayette College, Pennsylvania, March 26, 2011
21) Brown University Geometry/Topology Seminar "*Hypersurfaces with nonnegative scalar curvature*", Providence, March 16, 2011
22) ICCM 2010 *"On the center of mass in general relativity"*, Tsinghua University, Beijing, December 17-22, 2010
23) Workshop on Geometric Analysis *"Rigidity results for hypersurfaces in the sphere"*, Zhejiang University, Hangzhou, China, December 14-15, 2010
24) Columbia-Stony Brook joint General Relativity Seminar *"Specifying the angular momentum and center of mass for vacuum spacetimes",* Columbia University, New York, November 19, 2010

25) Geometric Analysis Seminar *"Specifying the angular momentum and center of mass for vacuum spacetimes",* Albert-Einstein-Institut, Golm, Germany, October 11, 2010

26) Mathematical Relativity "*Specifying the angular momentum and center of mass for vacuum spacetimes*", ICMS, Edinburgh, UK, September 1-7, 2010

27) Eighth Joint International Meeting of the AMS and the Sociedad Matemática "*Center of mass and constant mean curvature foliations for isolated systems in general relativity",* Berkeley, CA, June 2-5, 2010

28) Geometry Seminar "*Rigidity results on hemispheres*", Institute of Mathematics, Academia Sinica, Taipei, Taiwan, May 28, 2010

29) Columbia Undergraduate Mathematics Society, April 21, 2010

30) *SGS XVI Southeast Geometry Seminar*, Georgia Institute of Technology, Atlanta, GA, April 12, 2010

31) Johns Hopkins Analysis Seminar, February 22, 2010

32) *Workshop on General Relativity and Geometric Analysis,* Monash University in Melbourne, Australia, January 22 – 28, 2010.

33) Seminar, Bronx CC of CUNY, November 3, 2009

34) Princeton Geometric Analysis Seminar, October 30, 2009

35) CUNY Graduate Center Differential Geometry Seminar, October 27, 2009

36) Stony Brook Geometry/Topology Seminar, October 20, 2009

37) Duke Geometry/Topology Seminar, September 29, 2009

38) Columbia Geometry/Analysis Seminar, September 24, 2009

39) 2009 Sino-France Summer Institute on Geometric Analysis, Beijing University, China, July 6-July 24, 2009

40) Workshop in String Theory, General Relativity, and Partial Differential Equations at Harvard University, May 27-28, 2009

41) UC Irvine Geometry Seminar, May 5, 2009

42) *Center of mass and constant mean curvature foliations for isolated systems*, Thesis defense, Stanford University, May 1, 2009

43) The Ninth Pacific Rim Geometry Conference, Taiwan, December 10-14, 2008.

44) MIT Geometry Seminar, November 10, 2008.

45) The Ohio State University Geometry Seminar, November 4, 2008.

46) Seminar, Program on Geometry, Analysis, and General Relativity, Institut Mittag-Leffler, October 16, 2008.

47) *Existence of foliations by surfaces with constant mean curvature for isolated systems*. Geometry Seminar, National Taiwan University, June 2008.

48) *Definition of center of mass for isolated systems*. Geometry Seminar, National Taiwan University, December 2007.

REFERENCES

Richard Schoen (thesis advisor), Stanford University schoen@math.stanford.edu
Hubert Bray, Duke University bray@math.duke.edu
Panagiota Daskalopoulos, Columbia University pdaskalo@math.columbia.edu
Patrick Gallagher (teaching), Columbia University pxg@math.columbia.edu
Mu-Tao Wang, Columbia University mtwang@math.columbia.edu
Brian White, Stanford University white@math.stanford.edu