Sung-Jin Oh

CONTACT INFORMATION	Department of Mathematics University of California, Berkeley Berkeley, CA, USA 94720-3840	*Office:* Evans 887 *E-mail:* sjoh@math.berkeley.edu *Homepage:* http://math.berkeley.edu/∼sjoh

EMPLOYMENT

Assistant Professor (Aug. 2019 –)

    UC Berkeley, Berkeley, CA USA

CMC Research Professor (Jun. 2016 – Aug. 2019)

    KIAS, Seoul, Korea

Miller Research Fellow (Aug. 2013 – Jun. 2016)

    UC Berkeley, Berkeley, CA USA
- Host: Professor Daniel Tataru

VISITING POSITION *Adjunct Professor* (Nov. 2019 –)

    KIAS, Seoul, Korea

EDUCATION

Ph.D. in Mathematics (Sep. 2008 – Jun. 2013)

    Princeton University, Princeton, NJ USA
- Ph.D. Adviser: Professor Sergiu Klainerman
- Ph.D. Thesis on *Finite energy global well-posedness of the (3+1)-dimensional Yang-Mills equations using a Yang-Mills heat flow gauge*

B.S. in Mathematical Sciences (Sep. 2006 – Aug. 2008)

    KAIST, Daejeon, Republic of Korea
- *Summa cum Laude* with 4.24/4.30 GPA
- Senior Thesis Adviser : Professor Hong Oh Kim
- Senior Thesis on *An algebra of holomorphic functions on the disk.*

RESEARCH INTERESTS

Nonlinear wave and dispersive equations, mathematical physics general relativity, fluid mechanics, plasma physics, geometric flows.

AWARDS, FELLOWSHIPS AND HONORS

Young Scientist Award (2016)
- The Korean Academy of Science and Technology and the Ministry of Science, ICT and Future Planning.

TJ Park Science Fellowship (2017 – 2018)
- POSCO TJ Park Foundation

Miller Research Fellowship (2013 – 2016)
- Miller Institute for Basic Research in Science

Samsung Scholarship (Sep. 2008 – Aug. 2013)
- Samsung Scholarship

Presidential Scholarship (Sep. 2006 – Aug. 2008)
- Korea Science and Engineering Foundation (Now changed to National Research Foundation)

PUBLICATIONS   **Preprints**

1. *Asymptotic stability of harmonic maps on the hyperbolic plane under the Schrödinger maps evolution*, with A. Lawrie, J. Lührmann and S. Shahshahani. arXiv:1909.06899 [math.AP]

2. *On the Cauchy problem for the Hall and electron magnetohydrodynamic equations without resistivity I: Illposedness near degenerate stationary solutions*, with I.-J. Jeong. arXiv:1902.02025 [math.AP]

3. *Local smoothing estimates for Schrödinger equations on hyperbolic space*, with A. Lawrie, J. Lührmann and S. Shahshahani. arXiv:1808.04777 [math.AP]

4. *The Yang–Mills heat flow and the caloric gauge*, with D. Tataru. arXiv:1709.08599 [math.AP]

5. *The hyperbolic Yang–Mills equation in the caloric gauge. Local well-posedness and control of energy dispersed solutions*, with D. Tataru. arXiv:1709.09332 [math.AP]

6. *The threshold conjecture for the energy critical hyperbolic Yang–Mills equation*, with D. Tataru. arXiv:1709.08606 [math.AP]

7. *Dynamical black holes with prescribed masses in spherical symmetry*, with J. Luk and S. Yang. arXiv:1702.05717 [gr-qc]

8. *Finite energy global well-posedness of the Chern-Simons-Higgs equations in the Coulomb gauge.* arXiv:1310.3955 [math.AP]

Journal articles (refereed)

9. *Strong cosmic censorship in spherical symmetry for two-ended asymptotically flat initial data I. The interior of the black hole region*, with J. Luk, **Ann. of Math.** Vol 190, (2019), no. 1, pp. 1–111. arXiv:1702.05715 [gr-qc]

10. *Strong cosmic censorship in spherical symmetry for two-ended asymptotically flat initial data II. The exterior of the black hole region*, with J. Luk, **Ann. PDE.** Vol 5, (2019), no. 1. arXiv:1702.05716 [gr-qc]

11. *The hyperbolic Yang–Mills equation for connections in an arbitrary topological class*, with D. Tataru, **Comm. Math. Phys.** Vol. 365, (2019), no. 2, pp. 683–739. arXiv:1709.08604 [math.AP]

12. *Global well-posedness of high dimensional Maxwell–Dirac for small critical data*, with C. Gavrus, to appear in **Mem. Amer. Math. Soc.** arXiv:1604.07900 [math.AP]

13. *Solutions to the Einstein-scalar-field system in spherical symmetry with large bounded variation norms*, with J. Luk and S. Yang, **Ann. PDE.** Vol 4, (2018), no. 3. arXiv:1605.03893 [gr-qc]

14. *Small data global existence and decay for relativistic Chern-Simons equations*, with M. Chae, **Ann. Henri Poincaré** Vol. 18, (2017), no. 6, pp. 2123–2198. arXiv:1512.03039 [math.AP]

15. *The Cauchy problem for wave maps on hyperbolic space in dimensions $d \geq 4$*, with A. Lawrie and S. Shahshahani, **Int. Math. Res. Not. IMRN 2018**, no. 7, pp. 1954–2051. arXiv:1510.04296 [math.AP]

16. *Equivariant Wave Maps on the Hyperbolic Plane with Large Energy*, with A. Lawrie and S. Shahshahani, **Math. Res. Lett.** Vol. 24 (2017) no. 2, pp. 449–479. arXiv:1505.03728 [math.AP]

17. *On Nonperiodic Euler Flows with Hölder regularity*, with P. Isett, **Arch. Rational Mech. Anal. (ARMA).** Vol. 221 (2016), no. 2, pp. 725–804.

18. *On the Kinetic Energy profile of Hölder continuous Euler flows*, with P. Isett, **Ann. Inst. H. Poincaré Anal. Non Linéaire.** Vol. 34 (2017), no. 3, pp. 711–730.

19. *Local well-posedness of the (4+1)-dimensional Maxwell-Klein-Gordon equation at energy regularity*, with D. Tataru, **Ann. PDE.** Vol 2 (2016), no. 1. arXiv:1503.01560 [math.AP]

20. *Energy dispersed large energy solutions to the (4+1)-dimensional Maxwell-Klein-Gordon equation*, with D. Tataru, **Amer. J. Math.** Vol 140 (2018), no. 1, pp. 1–82. arXiv:1503.01561 [math.AP]

21. *Global well-posedness and scattering of the (4+1)-dimensional Maxwell-Klein-Gordon equation*, with D. Tataru, **Invent. Math.** Vol 205 (2016), no. 3, pp. 781–877. arXiv:1503.01562 [math.AP]

22. *A refined threshold theorem for (1+2)-dimensional wave maps into surfaces*, with A. Lawrie, **Comm. Math. Phys.** Vol 342, (2016), no. 3, pp. 989–999. arXiv:1502.03435 [math.AP]

23. *Gap Eigenvalues and Asymptotic Dynamics of Geometric Wave Equations on Hyperbolic Space*, with A. Lawrie and S. Shahshahani, **J. Funct. Anal.** Vol. 271 (2016), no. 11, pp. 3111-3161. arXiv:1502.00697 [math.AP]

24. *Proof of linear instability of the Reissner-Nordström Cauchy horizon under scalar perturbations*, with J. Luk, **Duke Math. J.** Vol. 166 (2017) no. 3, pp. 437–493. arXiv:1501.04598 [gr-qc]

25. *Profile decomposition for wave equations on hyperbolic space with applications*, with A. Lawrie and S. Shahshahani, **Math. Ann.** Vol. 365, (2016), no. 1–2, 707–803. arXiv:1410.5847 [math.AP]

26. *Stability of stationary equivariant wave maps from the hyperbolic plane*, with A. Lawrie and S. Shahshahani, **Amer. J. Math.** Vol. 39 (2017) no. 4, pp. 1085–1147. arXiv:1402.5981 [math.AP]

27. *Quantitative decay rates for dispersive solutions to the Einstein-scalar-field system in spherical symmetry*, with J. Luk, **Analysis & PDE.** Vol. 8 (2015), no. 7, pp. 1603–1674. arXiv:1402.2984 [gr-qc]

28. *Decay and scattering for the Chern-Simons-Schrödinger Equations*, with F. Pusateri. **Int. Math. Res. Not. IMRN 2015**, no. 24, pp. 13122–13147. arXiv:1311.2088 [math.AP]

29. *A heat flow approach to Onsager's conjecture for the Euler equations on manifolds*, with P. Isett, **Trans. Amer. Math. Soc.** Vol. 368 (2016), no. 9, pp. 6519–6537. arXiv:1310.7947 [math.AP]

30. *Gauge choice for the Yang-Mills equations using the Yang-Mills heat flow and local well-posedness in H^1*, **J. Hyperbolic Differ. Equ.** Vol. 11 (2014), no. 1, pp. 1-108. arXiv:1210.1558 [math.AP].

31. *Finite energy global well-posedness of the Yang-Mills equations on $\mathbb{R}^{1+3}$: An approach using the Yang-Mills Heat Flow*, **Duke Math. J.** Vol. 164 (2015), no. 9, pp. 1669-1732. arXiv:1210.1557 [math.AP].

32. *Low regularity solutions to the Chern-Simons-Dirac and the Chern-Simons-Higgs equations in the Lorenz gauge*, with H. Huh, **Comm. Partial Differential Equations.** Vol. 41 (2016), no. 3, 989–999. arXiv:1209.3841 [math.AP].

Proceedings, Reports and Expositions

33. *The Threshold Theorem for the energy critical hyperbolic Yang–Mills equation: an overview of the proof*, with D. Tataru, **Bull. Amer. Math. Soc.** Vol. 56 (2019), pp. 171–210. arXiv:1709.09088 [math.AP]

34. *The threshold theorem for the hyperbolic Yang–Mills equation*, **Oberwolfach Reports**, Vol. 14 (2017), no. 2, pp. 1697–1700.

35. *Global regularity and scattering for energy critical geometric wave equations*, **Oberwolfach Reports**, Vol. 13 (2016), no. 2, pp. 1534–1537.

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INVITED
CONFERENCE
TALKS

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- *Inaugural France-Korea Conference on Algebraic Geometry, Number Theory, and Partial Differential Equations.* Nov. 24th – Nov. 27th, 2019. Institut de Mathématiques, University of Bordeaux Talence, France.

- *Southern California Analysis and PDE Conference.* Nov. 2nd – Nov. 3rd, 2019. UC San Diego, La Jolla, CA, USA.

- *AMS Sectional Meeting, Special Session on Wave Phenomena in Fluids and Relativity.* Sep. 14th – Sep. 15th, 2019. University of Wisconsin, Madison, WI, USA.

- *The 4th Su-In mini workshop.* May 31st, 2019. Kyonggi University, Seoul, Korea.

- *CAU–Kyoto Workshop.* Apr. 26th, 2019. Chung Ang University, Seoul, Korea .

- *KMS Spring Meeting, Special Session on PDEs related with fluid mechanics.* Apr. 19th – 20th, 2019. Gangwon University, Chuncheon, Korea.

- *Mini workshop.* Mar. 7th – 8th, 2019. KAIST, Daejeon, Korea.

- *UNIST-POSTECH joint workshop on PDEs and related topics.* Feb. 14th – 15th, 2019. Gyeongju, Korea.

- *Mathematics of Fluid Motion II: Theory and Computation.* Dec. 26th – 28th, 2018. KIAS, Seoul, Korea.

- *The 3rd Meeting of Young Researchers in PDEs.* Dec. 13th – 15th, 2018. KIAS, Seoul, Korea.

- *Joint Meeting of KMS-DMV, Special Session on Nonlinear Partial Differential Equations: Hyperbolic and mixed problems.* Oct. 4, 2018. COEX, Seoul, Korea.

- *The 4th KTGU Mathematics Workshop for Young Researchers.* Sep. 29, 2018. Kyoto University, Kyoto, Japan.

- *Oberwolfach Workshop: Mathematical General Relativity.* Aug. 5th – 11th, 2018. MFO, Oberwolfach-Wälke, Germany.

- *PDE workshop 2018.* Jun. 21st – 23rd, 2018. NIMS, Daejeon, Korea.

- *Mathematical General Relativity.* May. 28th – Jun. 1st, 2018. Institut Henri Poincaré, Paris, France.

- *Korea PDE School.* Jan. 29th – Feb. 2nd, 2018. NIMS, Daejeon, Korea.

- *KAIST-KIAS Joint Workshop in Theoretical Sciences.* Dec. 13th – 14th, 2017. KAIST, Daejeon, Korea.

- *KMS Annual Meeting, Invited sectional speaker in Analysis.* Oct. 28th, 2017. Dankook University, Cheonan, Korea.

- *The Second Meeting of Young Researchers in PDE.* Jul. 13th – 14th, 2017. UNIST, Ulsan, Korea.

- *Oberwolfach Workshop: Nonlinear Waves and Dispersive Equations.* Jun. 11th – Jun. 17th, 2017. MFO, Oberwolfach-Wälke, Germany.

- *Joint Mathematics Meeting, AMS Special Sessions on Recent Progress on Nonlinear Dispersive and Wave Equations and on Spectral Calculus and Quasilinear Partial Differential Equations.* Jan. 4th – Jan. 7th, 2017.
- *KMS Annual Meeting, Special Session on PDE.* Oct. 22nd – Oct. 23rd, 2016. Seoul National University, Seoul, Korea.
- *KIAS 20th Anniversary Conference.* Sep. 27th – Sep. 28th, 2016. KIAS, Seoul, Korea.
- *The First Meeting of Young Researchers in PDE.* Aug. 11th – Aug. 12th, 2016. Yonsei University, Seoul, Korea.
- *Workshop on Wave Equations.* Jul. 22nd, 2016. IMS and Department of Mathematics, Chinese University of Hong Kong, Hong Kong.
- *The Second French-Korean Conference.* Jul. 7th – Jul. 12th, 2016. Institut de Mathématiques, University of Bordeaux, Talence, France.
- *Oberwolfach Workshop: Nonlinear Evolution Problems.* May 29th – Jun. 4th, 2016. MFO, Oberwolfach-Wälke, Germany.
- *IHES Trimester on Nonlinear Waves: May Conference.* May 23rd – 27th, 2016. Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France.
- *Singularity formation and long-time behavior in dispersive PDEs.* Mar. 14th – 18th, 2016. University of Bonn, Bonn, Germany.
- *Workshop on Geometric Hyperbolic PDE.* Sep. 30th – Oct. 2nd, 2015. Imperial College, London, UK.
- *Harmonic Analysis and Partial Differential Equations.* Jul. 27th – 31st, 2015. International Centre for Mathematical Sciences, Edinburgh, UK.
- *Nonlinear wave equations and their numerical study*, as a part of *Focus Program on 100 Years of General Relativity.* Jun. 22nd – 28th, 2015. Fields Institute, Toronto, Ontario, Canada.
- *Singularities in General Relativity*, as a part of *Focus Program on 100 Years of General Relativity.* Jun. 15th – 19th, 2015. Fields Institute, Toronto, Ontario, Canada.
- *Mathematical Problems in General Relativity.* Jan. 19th – Jan. 23rd, 2015. Simons Center for Geometry and Physics, Stony Brook, NY, USA.
- *AMS Sectional Meeting, Special Session on Hamiltonian Partial Differential Equations.* Oct. 25th – Oct. 26th, 2014. San Francisco State University, San Francisco, CA, USA.
- *Dynamics in Geometric Dispersive Equations and the Effects of Trapping, Scattering and Weak Turbulence.* May 4th – May 9th, 2014. BIRS, Banff, Alberta, Canada.
- *Inaugural Conference.* Jun. 20th – Jun. 22nd, 2013. IBS Center for Geometry and Physics, Pohang, Korea.
- *Conference on Nonlinear Wave Equations.* May 21st – May 24th, 2013. Intitut Henri Poincaré, Paris, France

INVITED SEMINARS AND COLLOQUIA

- *Informal Seminar.* Nov. 28th, 2019. École Polytechnique, Palaiseau, France
- *Analysis and PDE Seminar.* Sep. 16th, 2019. UC Berkeley, Berkeley, CA, USA.
- *Colloquium.* Jun. 14th, 2019. Ajou University, Suwon, Korea.
- *Colloquium.* May 30th, 2019. Pusan National University, Busan, Korea.
- *Seminar.* May. 28th, 2019. Chosun University, Gwangju, Korea.

- *Colloquium.* May 23rd, 2019. Sookmyung Women's University, Seoul, Korea.
- *Seminar.* May. 17rd, 2019. Seoul National University, Seoul, Korea.
- *Colloquium.* May 16th, 2019. Ewha Womans University, Seoul, Korea.
- *Seminar.* Apr. 23rd, 2019. Seoul National University, Seoul, Korea.
- *PDE Seminar.* Oct. 29th, 2018. KAIST, Daejeon, Korea.
- *Colloquium.* Oct. 25th, 2018. Inha University, Incheon, Korea.
- *Seminar.* Jun. 26th, 2018. Kyung Hee University, Seoul, Korea.
- *Intercollegiate Undergraduate ("Stupid Mathematics") Seminar.* Feb. 23rd, 2018. Sogang University, Seoul, Korea.
- *Special Seminar.* Feb. 12th, 2018. Columbia University, New York, NY, USA.
- *Thematic Seminar: Partial Differential Equations.* Jan. 24th, 2018. UC Berkeley, Berkeley, CA, USA.
- *Colloquium.* Jan. 19th, 2018. UC Davis, Davis, CA, USA.
- *Mathematics Colloquium.* Jan. 17th, 2018. UC San Diego, La Jolla, CA, USA.
- *Geometry/Physics Seminar.* Jan. 11th, 2018. Northwestern University, Evanston, IL, USA.
- *Differential Equations Seminar.* Jan. 8th, 2018. University of Michigan, Ann Arbor, MI, USA.
- *Geometry Seminar.* May 18th, 2017. Stanford University, Palo Alto, CA, USA.
- *Analysis and PDE Seminar.* May 9th, 2017. UC Berkeley, Berkeley, CA, USA.
- *Colloquium.* Mar. 31st, 2017. Postech, Pohang, Korea
- *Colloquium.* Mar. 23th, 2017. Yonsei University, Seoul, Korea
- *Colloquium.* Mar. 16th, 2017. Sungkyunkwan University, Suwon, Korea
- *Colloquium.* Mar. 9th, 2017. Seoul National University, Seoul, Korea
- *Geometry and Analysis Seminar.* Dec. 9th, 2016. Columbia University, New York, NY, USA.
- *Invited Seminar.* Dec. 2nd, 2016. Simons Foundation, New York, NY, USA.
- *Analysis Seminar.* Nov. 28th, 2016. Princeton University, Princeton, NJ, USA.
- *Seminar.* Nov. 22nd, 2016. Yonsei University, Seoul, Korea.
- *PDE Seminar.* Nov. 17th, 2016. Postech, Pohang, Korea.
- *CGP Seminar.* Nov. 15th, 2016. IBS Center for Geometry and Physics, Pohang, Korea.
- *Harmonic Analysis Seminar.* Nov. 8th, 2016. Seoul National University, Seoul, Korea.
- *Seminar.* Oct. 27th, 2016. Korea University, Seoul, Korea.
- *Seminar.* Oct. 11th, 2016. Seoul National University, Seoul, Korea.
- *Colloquium.* Oct. 6th, 2016. KAIST, Daejeon, Korea.
- *Analysis Seminar.* May. 3rd, 2016. UC San Diego, La Jolla, CA, USA.
- *Geometric PDE Seminar.* Apr. 19th, 2016. Rutgers University, New Brunswick, NJ, USA.
- *Analysis and PDE Seminar.* Apr. 11th, 2016. Johns Hopkins University, Baltimore, MD, USA.
- *PDE Seminar.* Apr. 6th, 2016. Georgia Tech, Atlanta, GA, USA.

- *Probability/PDE Seminar.* Apr. 1st, 2016 UC Berkeley, Berkeley, CA, USA.
- *Analysis Seminar.* Mar. 21st, 2016. University of Edinburgh, Edinburgh, UK.
- *CGP Seminar.* Feb. 17th, 2016. IBS Center for Geometry and Physics, Pohang, Korea.
- *Seminar in Mathematics.* Feb. 17th, 2016. Chung Ang University, Seoul, Korea.
- *Analysis and PDE Seminar.* Feb. 2nd, 2016. University of Kentucky, Lexington, KY, USA.
- *Student Harmonic Analysis and Differential Equations Seminar (HADES).* Feb. 9th, 2016 UC Berkeley, Berkeley, CA, USA.
- *Seminaire d'Analyse Numérique et E.D.P.* Dec. 10th, 2015. Université Paris-Sud, Orsay, France.
- *PDE Seminar.* Dec. 4th, 2015. Imperial College, London, UK.
- *PDE Seminar.* Dec. 2nd, 2015. University of Oxford, Oxford, UK.
- *IHP Seminar.* Nov. 25th, 2015. Institut Henri Poincaré, Paris, France.
- *BCTP String Theory Group Lunch.* Nov. 4th, 2015. Berkeley Center for Theoretical Physics, Berkeley, CA, USA.
- *Postdoc Symposium.* Sep. 18th, 2015. MSRI, Berkeley, CA, USA.
- *Colloquium.* May 29th, 2015. UNIST, Ulsan, Korea.
- *Seminar.* May 12th, 2015. Seoul National University, Seoul, Korea.
- *Seminar in Mathematics.* May 11th, 2015. Chung Ang University, Seoul, Korea.
- *Analysis and PDE Seminar (Joint with Caltech).* May 1st, 2015. UCLA, Los Angeles, CA, USA.
- *Calderón-Zygmund Analysis Seminar.* Apr. 20th, 2015. University of Chicago, Chicago, IL, USA.
- *PDE Geometric Analysis Seminar.* Apr. 13th, 2015. University of Wisconsin-Madison, Madison, WI, USA.
- *Colloquium.* Apr. 3rd, 2015. Georgia Southern University, Statesboro, GA, USA.
- *Geometric Analysis and Partial Differential Equations seminar.* Nov. 17th, 2014. University of Cambridge, Cambridge, UK.
- *Geometry and Analysis Seminar.* Nov. 12th, 2014. UC Santa Cruz, Santa Cruz, CA, USA
- *Analysis and PDE Seminar.* Nov. 10th, 2014. UC Berkeley, Berkeley, CA, USA.
- *Student Harmonic Analysis and Differential Equations Seminar (HADES).* Nov. 4th, 2014. UC Berkeley, Berkeley, CA, USA.
- *PDE and Applied Math Seminar.* Oct 16th, 2014. UC Davis, Davis, CA, USA.
- *Diff. Geom, Math. Phys., PDE Seminar.* May 12th, 2014. UBC, Vancouver, British Columbia, Canada.
- *Analysis and PDE Seminar.* Mar. 11th, 2014. MIT, Cambridge, MA, USA.
- *Analysis and PDE Seminar.* Feb. 24th, 2014. UC Berkeley, Berkeley, CA, USA.
- *Paris-Berkeley-Bonn-Zürich Analysis Seminar.* Jan. 30th, 2014.
- *Student Harmonic Analysis and Differential Equations Seminar (HADES).* Dec. 10th, 2013. UC Berkeley, Berkeley, CA, USA.
- *Analysis and PDE Seminar (Joint with Caltech).* Dec. 6th, 2013. UCLA, Los Angeles, CA, USA.

- *Seminar in Mathematics.* Jun. 24th, 2013. Chung Ang University, Seoul, Korea.
- *PDE Seminar.* Jun. 19th, 2013. KAIST, Daejeon, Korea
- *Analysis Seminar.* Apr. 23rd, 2013. University of Pennsylvania, Philadelphia, PA, USA.
- *Analysis Seminar.* Mar. 25th, 2013. Princeton University, Princeton, NJ, USA.
- *Open House Graduate Student Talk.* Mar. 22nd, 2013. Princeton University, Princeton, NJ USA.
- *PDE Seminar.* Jan. 15th, 2013. KAIST, Daejeon, Korea
- *PDE Group Seminar.* Oct. 25th, 2012. EPFL, Lausanne, Switzerland.
- *Applied Math Seminar.* Jul. 5th, 2012. KAIST, Daejeon, Korea.
- *Seminar in Mathematics.* Jul. 3rd, 2012. Chung Ang University, Seoul, Korea.
- *Seminar.* May 30th, 2012. AEI (Max-Planck-Institut für Gravitationsphysik), Potsdam, Germany.
- *Analysis Seminar.* Jul. 6th, 2011. KAIST, Daejeon, Korea.

INVITED
LECTURE SERIES

- *Lecture Series.* May 22nd, 24th and 27th, 2019. Yonsei University, Seoul, Korea. A six-hour lecture series on 'The Cauchy problem for the Hall magnetohydrodynamics equation'
- *UNIST Lecture Series.* Oct. 5th – 8th, 2018. UNIST, Ulsan, Korea. A three-hour lecture series on 'The Cauchy problem for the Hall magnetohydrodynamics equation'
- *IBS-CGP Mathematics Festival 2018.* Aug 13th–17th, 2018. IBS-CGP, Pohang, Korea. A three-hour lecture series on 'Variations on a theme: On the dispersion of waves'
- *Lecture Series on Topics in PDEs.* Feb 13th–24th, 2017. KIAS, Seoul, Korea. A five-hour lecture series on 'The energy critical Yang–Mills equation'
- *UNIST Intensive Lecture Series.* Feb 22nd–26th, 2016. UNIST, Ulsan, Korea. A six-hour lecture series on 'Nonlinear wave equations.'
- *KMRS Seminar.* May 19th–20th, 2015. KAIST, Daejeon, Korea. A three-hour lecture series 'On energy critical geometric wave equations.'
- *Analysis and PDE Seminar.* May 13th–14th, 2015. KIAS, Seoul, Korea. A four-hour lecture series on the 'Vector field method and the nonlinear global stability of Minkowski space.'

OTHER
CONFERENCES
ATTENDED AS A
PARTICIPANT

- *Analysis, PDE's and Geometry. A conference in honor of Sergiu Klainerman.* Jan. 26th – Jan. 29th, 2016. Princeton University, Princeton, NJ, USA.
- *Rivière-Fabes Symposium on Analysis and PDE.* Apr. 17th – Apr. 19th, 2015. University of Minnesota, Minneapolis, MN, USA.
- *Harmonic Analysis & PDEs: Recent Developments & Future Directions. A conference in honor of C.E. Kenig.* Sep. 19th – Sep. 21st, 2014. University of Chicago, Chicago, IL, USA.
- *International Congress of Mathematics.* Aug. 13th – Aug. 21st, 2014. COEX, Seoul, Korea
- *Oberwolfach Workshop: Nonlinear Waves and Dispersive Equations.* Aug. 11th – 17th, 2013. MFO, Oberwolfach-Wälke, Germany.
- *Oberwolfach Seminar: Dispersive equations.* Oct. 14th – 20th, 2012. MFO, Oberwolfach-Wälke, Germany.

Previous visiting positions	• *Research Member* (Aug. 2015 – Nov. 2015) at **MSRI**, Berkeley, CA, USA. Program: *New Challenges in PDE: Deterministic Dynamics and Randomness in High and Infinite Dimensional Systems.* • *Participant* (Nov. 2015 – Dec. 2015) at **IHP**, Paris, France. Program: *Mathematical General Relativity.* • *Visiting Student* (Feb. 2011 – Jun. 2011, May 2012) at DMA, **École Normale Supérieure**, Paris, France.

Teaching Experiences

Instructor

- UC Berkeley, Berkeley, CA USA
  - Partial Differential Equations (Math 222A) 2019 Fall.
  - Topics in Analysis (Math 278) 2019 Fall
    A topics course on general relativity in spherical symmetry.
  - Nonlinear hyperbolic PDEs (Math 290) Jan. 2015 – Mar. 2015.
    A topics course on the vector field method and the Lindblad-Rodnianski proof of global nonlinear stability of the Minkowski space.

- Princeton University, Princeton, NJ USA
  - Calculus and Analytic Geometry (MAT101)
    2010 Fall

Grader

- Princeton University, Princeton, NJ USA
  - Calculus and Analytic Geometry (MAT101)
    Sep. 2010 – Jan. 2011
  - Special Topics in Analysis (MAT433)
    Sep. 2009 – Jan. 2010
  - Introduction to Real Analysis (MAT314)
    Sep. 2009 – Jan. 2010

Academic services

Organizer for conferences
- *Oberwolfach Workshop: Nonlinear evolution equations: Analysis and Numerics.* Proposal accepted for 2019 (with M. Hochbruck, H. Koch and A. Ostermann).

Referee for academic journals
- Adv. Math., Anal. PDE, Amer. J. Math., Ann. Henri Poincaré, Ann. Inst. H. Poincaré Anal. Non Linéaire, Ann. of Math., Ann. PDE, Ann. Sci. Éc. Norm. Supér., Bull. Soc. Math. Fr., Cambridge J. Math., Comm. Math. Phys., Comm. Pure Appl. Math., Differ. Integral Equ., Duke Math. J., Dyn. PDE, Int. Math. Res. Not., Invent. Math., J. Amer. Math. Soc, J. Eur. Math. Soc, J. Math. Anal. Appl., Mem. Amer. Math. Soc., Math. Proc. Cambridge Phil. Soc., NoDEA, Proc. Amer. Math. Soc., SIAM J. Math. Anal.

Organizer for lectures, seminars & colloquia
- *CMC Seminar* at KIAS, Seoul, Korea. (Jun. 2016 –)
- *Minicourse: General relativity in spherical symmetry* at KIAS, Seoul, Korea. (Apr. 2017)
- *Analysis & PDE Seminar* at Department of Mathematics, UC Berkeley, Berkeley, CA USA. (Aug. 2013 – May 2014, with A. Lawrie and M. Beceanu)
- *Undergraduate Colloquium Program* at Department of Mathematical Sciences, KAIST, Daejeon, Korea. (Sep. 2007 – Aug. 2008)

OUTREACH
ACTIVITIES

- *Lecture.* Jun. 18, 2019. Busan Science High School, Busan, Korea.
- *Lecture.* Sep. 14, 2018. Korea Science Academy, Busan, Korea.
- *Public lecture*, Apr. 11, 2018. KAOS Foundation, Seoul, Korea. Participated in a panel discussion and gave a 3-minute talk on *General relativity as geometry.* Video available at `http://tv.naver.com/v/3024498` (in Korean)
- *Lecture.* Nov. 14, 2017. Seoul Science High School, Seoul, Korea.

REFERENCES

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