

## Curriculum vitae of Benoît Pausader May 2023

Birth date: october 3, 1982.

French citizen.

### Address:

Kassar House, 151 Thayer street

Providence, RI, 02912, USA

**email:** benoit.pausader@gmail.com

**webpage:** <https://www.math.brown.edu/~benoit.pausader/>

### Education:

2002: École normale supérieure de Lyon.

2004: Erasmus semester, Uppsala university.

2005: Agrégation de mathématique.

Master of pure and applied mathematics.

2008: PhD defense, advisor: Emmanuel Hebey, university of Cergy-Pontoise.

### Position:

2006: Assistant moniteur normalien, Cergy-Pontoise university.

2008: Tamarkin assistant professor, Brown University.

2011: Courant Instructor, New York University.

2012: Chargé de recherche, CNRS, U. Paris 13 (on leave 2013).

2013: Assistant professor, Princeton University.

2015: Associate professor, Brown University.

2021: Full professor, Brown University.

### Publications:

[1] Scattering and the Levandosky-Strauss conjecture for fourth order nonlinear wave equations, *J. Differential Equations*, 241 (2), (2007), 237–278.

[2] Global well-posedness for energy critical fourth-order Schrödinger equations in the radial case, *Dynamics of PDE*, 4 (3), (2007), 197–225.

[3] The focusing energy-critical fourth-order Schrödinger equation with radial data, *Discrete Contin. Dyn. Syst.* 24 (2009), no. 4, 1275–1292.

[4] The cubic fourth-order Schrödinger equation, *J. Funct. Anal.* 256 (2009), 8, 2473–2517.

[5] Analyticity of the nonlinear scattering operator (with W.A. Strauss), *Discrete Contin. Dyn. Syst.* 25 (2009), no. 2, 617–626.

[6] Scattering for the Beam equation in small dimensions, *Indiana. Univ. Math. J.*, 59 (2010), no. 3, 791–822.

[7] The mass-critical fourth-order Schrödinger equation in high dimensions (with S. Shao), *J. Hyp. Diff. Equ.*, 7 (2010), no. 4, 651–705.

[8] The linear profile decomposition for the fourth order Schrödinger equation (with J.C. Jiang and S. Shao), *J. Differential Equations* 249 (2010), 2521–2547.

[9] Global Smooth Ion Dynamics in the Euler-Poisson System (with Y. Guo), *Comm. Math. Phys.* 303 (2011), 89–125.

[10] On the global well-posedness of energy-critical Schrödinger equations in curved spaces (with A. Ionescu and G. Staffilani), *Analysis and PDE*, Vol. 5 (2012), no. 4, 705–746.

[11] Global well-posedness of the energy-critical defocusing NLS on  $\mathbb{R} \times \mathbb{T}^3$ , (with A. Ionescu), *Comm. Math. Phys.*, 312 (2012), no. 3, 781–831.

- [12] The energy-critical defocusing NLS on  $\mathbb{T}^3$ , (with A. Ionescu), *Duke Math. J.*, 161 (2012), no. 8, 1581–1612.
- [13] The Euler–Poisson system in  $2D$ : global stability of the constant equilibrium solution (with A. Ionescu), *Int. Math. Res. Not.*, 2013 (2013), 761–826.
- [14] Non-neutral global solutions for the electron Euler–Poisson system in  $3D$  (with P. Germain and N. Masmoudi), *SIAM J. Math. Anal.* 45-1 (2013), 267–278.
- [15] Dynamics of particle settling and resuspension in viscous liquid films, (with N. Murisic, D. Peschka and A.L. Bertozzi), *J. Fluid Mech.* 717 (2013), 203–231.
- [16] Scattering theory for the fourth-order Schrödinger equation in low dimensions (with S. Xia), *Nonlinearity*, 26 (2013), no. 8, 2175–2191.
- [17] On scattering for the quintic defocusing nonlinear Schrödinger equation on  $\mathbb{R} \times \mathbb{T}^2$  (with Z. Hani), *Comm. Pure and Appl. Math.* 67 (2014), no. 9, 1466–1542.
- [18] Global solutions of quasilinear systems of Klein–Gordon equations in  $3D$  (with A. Ionescu), *J. Eur. Math. Soc.*, 16, (2014), no. 11, 2355–2431.
- [19] Global regularity for the energy-critical NLS on  $\mathbb{S}^3$  (with N. Tzvetkov and X. Wang), *Ann. Inst. H. Poincaré Anal. Non Linéaire* 31 (2014), no. 2, 315–338.
- [20] Topography influence on the Lake equations in bounded domains (with C. Lacave and T. Nguyen), *J. Math. Fluid Mech.* 16 (2014), no. 2, 375–406.
- [21] Global solutions of certain plasma fluid models in  $3D$  (with Y. Guo and A. Ionescu), *J. Math. Phys.* 55, 123102 (2014).
- [22] Modified scattering for the nonlinear Schrödinger equation on product space and applications (with Z. Hani, N. Tzvetkov and N. Visciglia), *Forum of Math., Pi*, Vol. 3 / 2015, e4.
- [23] Global solutions of the Euler–Maxwell two-fluid system in  $3D$  (with Y. Guo and A. Ionescu), *Annals of Math.*, (2) 183 (2016), 377–498.
- [24] Discrete Schrödinger equation and ill-posedness for the Euler equation (with I.J. Jeong), *DCDS-A*, 37 (2017), no. 1, 281–293.
- [25] The Euler–Maxwell system for electrons: global solutions in  $2D$  (with Y. Deng and A. Ionescu), *Arch. Rational Mech. Anal.* (2017) 225–771.
- [26] Global solutions of the gravity-capillary water wave system in 3 dimensions (with Y. Deng, A. Ionescu and F. Pusateri), *Acta Math.*, Vol. 219., No 2, (2017), 213–402.
- [27] The profile decomposition for the hyperbolic Schrödinger equation (with B. Dodson, J. Marzuola and D. Spirn), *Illinois J. of Math.*, 62 (2018), no. 1-4, 293–320.
- [28] On the global regularity for a Wave-Klein-Gordon coupled system (with A. Ionescu), *Acta. Math. Sin.-English Ser.* (2019) 35: 933.
- [29] Derivation of the ion equation (with E. Grenier, Y. Guo and M. Suzuki), *Quart. Appl. Math.*, 78 (2020), 305–332.
- [30] Global stability of solutions of the Einstein-Klein-Gordon system: a review. (with A. Ionescu), *Quart. Appl. Math.*, 78 (2020), 277–303.
- [31] A paradifferential approach for well-posedness of the Muskat problem (with H. Ngyuen), *Arch. Rational Mech. Anal.*, 237, 35–100 (2020).
- [32] Global endpoint Strichartz estimates for Schrödinger equations on the cylinder  $\mathbb{R} \times \mathbb{T}$ . (with A. Barron and M. Christ), *Nonlinear Anal.* 206 (2021), 112172.
- [33] Global stability of solutions of the Einstein-Klein-Gordon system. (with A. Ionescu), *Annals of Mathematics Studies*, 213. Princeton University Press, Princeton, NJ, 2022. ix+296 pp.

- [34] Stability of a point charge for the Vlasov-Poisson system: the radial case. (with K. Widmayer), *Commun. Math. Phys.* 385, 1741–1769 (2021).
- [35] On the asymptotic behavior of solutions to the Vlasov-Poisson system. (with A. Ionescu, X. Wang and K. Widmayer), *Int. Math. Res. Not.* IMRN 2022, no. 12, 8865–8889.
- [36] Scattering map for the Vlasov-Poisson system (with P. Flynn, Z. Ouyang and K. Widmayer), *Peking Math J.* (2021). <https://doi.org/10.1007/s42543-021-00041-x>
- [37] On the stabilizing effect of rotation in the 3D Euler equations (with Y. Guo, C. Huang and K. Widmayer), *Comm. Pure and Appl. Math.*, to appear.
- [38] Self-similar solutions for the Muskat equation (with E. Garcia-Juarez, J. Gomez-Serrano and H.Q. Nguyen), *Adv. Math.* 399 (2022), Paper No. 108294.
- [39] Global Axisymmetric Euler Flows with Rotation (with Y. Guo and K. Widmayer), *Invent. math.* 231, 169–262 (2023).
- [40] Note on the dissipation for the general Muskat problem, (with S. Haziot), *Quart. Appl. Math.* 81 (2023), 367–373.

#### Preprints:

- [41] Nonlinear Landau damping for the Vlasov-Poisson system in  $\mathbb{R}^3$ : the Poisson equilibrium, (with A. Ionescu, X. Wang and K. Widmayer) preprint (2022).
- [42] Stability of a point charge for the repulsive Vlasov-Poisson system, (with K. Widmayer and J. Yang), preprint (2022).
- [43] On the stability of homogeneous equilibria in the Vlasov-Poisson system on  $\mathbb{R}^3$ , (with A. Ionescu, X. Wang and K. Widmayer) preprint (2023).
- [44] Desingularization of small moving corners for the Muskat equation (with E. Garcia-Juarez, J. Gomez-Serrano and S. Haziot), preprint (2023).

#### Expository articles:

- [1] An introduction to fourth order nonlinear wave equations, (with E. Hebey), available at <http://www.math.brown.edu/~benoit/>
- [2] Scattering for the Beam equation, *Proceedings of GDR “analyse des équations aux dérivées partielles”*, Évier, 2008.
- [3] Growing Sobolev norms for the cubic defocusing Schrödinger equation. Séminaire: Équations aux Dérivées Partielles. (with Z. Hani, N. Tzvetkov and N. Visciglia) 2013–2014, Exp. No. X VI, 11 pp., Sémin. Équ. Dériv. Partielles École Polytech., Palaiseau, 2014.
- [4] ICERM: 10 years later, newsletter of the EMS.

#### Graduate students:

Zhimeng Ouyang (2016-2021), then Dickson instructor at U. Chicago.  
 Patrick Flynn (2019-2023), then Hedricks instructor at UCLA.  
 Haram Ko (2022-)

#### Administrative duties:

2019 – 2022: Director of Undergraduate Studies

#### Awards:

NSF- Grant (DMS-1069243, DMS-1362940, DMS-1700282, DMS-2154162).

NSF- Grant DMS-1759513 (conference on nonlinear waves).

NSF- Grant DMS-1929284 (co-PI on the ICERM renewal)

Member of ANR “SchEq” and “Anae”.

Sloan Research Fellowship.

Fellow in residence, CY-Advanced studies.

Simons Fellowship (2021).

### Conference organized:

Workshop on jets and droplets in fluids (part of ICERM semester program 2017).

Conference on Nonlinear waves in honor of W. Strauss (2018).

SUMS conference (yearly 2019 – 2022).

ICERM semester “Hamiltonian methods in nonlinear dispersive and wave equations”.

Co-founder and coorganizer of the ONEPAS online seminar.

### Editorial work:

Editor for *Quarterly of Applied Math* (2019-),

Editor for *Proceedings of the AMS* (2022-).

### Teaching experience:

2006: Association “Math En Jean”.

Basic Calculus.

2007: Association “Math En Jean”.

Humanitarian volunteering in Madagascar.

Calculus, prépa ensi.

Series.

2008: Calculus, prépa ensi.

Intermediate calculus (for engineers).

2009: Linear algebra, Honors calculus.

2010: Analysis.

Linear Algebra, 1D Calculus (for engineers).

2011: PDE.

Tools for dispersive equations (summer graduate course, Peking University).

Calc II.

2013: NLS in different geometries (summer graduate course, U. Lille).

Calc II.

2014: Calc II.

2015: Funct. Analysis

Topics on quasilinear dispersive equations (G).

2016: Calc III. (U)

Asymptotic behavior of dispersive equations (short course, IHES).

2017: Calc III. (U), ODE (U), PDE-2 (G), Real Analysis (G).

2018: Functional analysis (G), PDE-1 (G).

2019: PDE (U), Real analysis (G).

2020: Functional analysis (G), Introduction to general relativity (G), ODE (U).

2021: mini course on local wellposedness for dispersive equations.

2022: Complex analysis II (G), PDE-1 (G).

2023: PDE-2 (G), ODE (U).

G: graduate course; U: undergraduate course

**Invited talks:**

- 2007: Nonlinear hyperbolic equations and related topics, SNS Pisa.  
PDE seminar, Brown U.  
PDE and Mathematical Physics seminar, University of Paris 13.  
Analysis seminar, ETH Zurich.
- 2008: Analysis and geometry seminar, Nice U.  
GDR Analyse des équations aux dérivées partielles, Évian.  
PDE seminar, Brown U.
- 2009: Analysis seminar, Princeton U.  
AMS session “Effective Dynamics and Interactions of localized structures in Schrödinger type equations”, Worcester.  
Analysis seminar, MIT.  
Analysis seminar, Brown U.  
AMS session “Fluid dynamics”, UC Riverside.  
Analysis seminar, UConn, Storrs.  
Analysis seminar, U. Wisconsin, Madison.
- 2010: Analysis seminar, U. of Tunis.  
Analysis seminar, McGill U.  
PDE seminar, U. Minnesota, Minneapolis.  
Annual FRG meeting, Brown U.  
PDE seminar, Beijing International Center for Mathematical Research, Beijing.  
Analysis seminar, Iapcm, Beijing.  
Analysis seminar, Brown U.  
Analysis seminar, Princeton U.  
Analysis seminar, UT Austin.  
Analysis seminar, Cornell U.
- 2011: Colloquium, UBC, Vancouver.  
Colloquium, Michigan State U.  
Analysis seminar, Courant institute.  
Brown/Paris 6 videoconference seminar, Brown U.  
AMS session “Harmonic analysis and PDE”, Statesboro, GA.  
Nonlinear analysis and PDE seminar, Paris 6 - 7 - ENS.  
PDE seminar, Rennes U.  
Brown/B-U dynamical system seminar.  
Analysis seminar, Princeton U.  
Applied Analysis and Computational Math seminar, UMass, Amherst.  
Analysis seminar, UCLA.  
Peking University Summer School, Beijing.  
International Workshop on PDE and Dynamical Systems, Kunming, China.  
Analysis seminar, Courant Institute.  
Analysis seminar, Princeton U.  
AMS session “Harmonic analysis and PDE”, Salt Lake city, UT.
- 2012: Séminaire Laurent Schwartz, IHES.  
Geometric Analysis and PDE seminar, Cambridge U.  
Meeting “Nonlinear Evolution Problems”, Oberwolfach.  
Séminaire EDP non-linéaires, Paris 13.  
International Workshop on PDE and Dynamical Systems, Mianyang, China.

- GDR “RAS”, CIRM, Luminy.  
 ERC BlowDiSol, Rome.  
 Séminaire d’analyse, U. Lille.  
 Séminaire AGM, U. Cergy.
- 2013: 4-th itinerant workshop on PDE’s, Rome.  
 CNA seminar, Carnegie Mellon U.  
 Brown PDE workshop, Brown U.  
 Analysis seminar, U. Paris-11, Orsay.  
 Conference “Handdy”, CIRM, Luminy.  
 Meeting “Nonlinear waves and dispersive equations”, Oberwolfach.  
 Fluids seminar, Princeton U.  
 Analysis seminar, Princeton U.  
 Analysis seminar, U. Penn.  
 Analysis seminar, Courant Institute.
- 2014: Analysis seminar, IMPA.  
 AMS session “Dispersive and geometric PDE”, Baltimore.  
 Colloquium, Brown U.  
 Analysis seminar, UNC.  
 CIRM, Luminy,  
 Workshop “Harmonic analysis methods in dispersive PDEs”, HIM, Bonn.  
 AMS sessional meeting, SFU.  
 Workshop “Asymptotics for Nonlinear Geometric PDEs”, SNS Pisa.  
 Ergodic theory and statistical mechanics seminar, Princeton U.,
- 2015: PDE workshop, Brown U.,  
 Session “Long time dynamics of nonlinear dispersive waves”, IMACS, Athens.  
 Analysis seminar, Georgia Tech,  
 Conference “Longtime behavior of nonlinear waves”, Bielefeld U.  
 Conference “Water waves and related fluid models”, CMI, Oxford.  
 Workshop “New challenges in PDE: deterministic dynamics and randomness  
 in high and infinite dimensional systems”, MSRI, Berkeley.  
 PDE seminar, UC Davis.  
 Siam PDE Meeting, Scottsdale, AZ.
- 2016: Séminaire “Géométrie, EDP et Physique mathématique”, U. Cergy.  
 Colloquium, Kansas U.  
 Conférence “Théorie spectrale et physique mathématique”, U. Cergy.  
 AMS sectional meeting, Minneapolis.
- 2017: ICERM seminar  
 Workshop “On the essence of  $u \cdot \nabla u$ ”, U. Virginia.  
 GDR “Analyse des EDP”, Roscoff.  
 Workshop on Nonlinear Waves, Oberwolfach.  
 Conference: “AGM-LPTM: the first 25 years”, U. Cergy.  
 CIRM, Luminy.  
 Session “nonlinear dispersive PDEs”, Math. congress of America, Montreal.  
 Special session on dispersive equations, AMS Sessional meeting, U. Buffalo  
 Conference “Waves, Spectral Theory and Applications Part 2”, Chapel Hill.  
 Physics Colloquium, UMass Boston.
- 2018: Geometric analysis seminar, McGill, Montreal.  
 CAMS Colloquium, USC.

- Analysis seminar, Princeton U.  
 Special sessions on “analysis of dispersive equations”, & on “nonlinear and stochastic PDE and applications”, AMS Sectional Meeting, Northeastern U.  
 Conference “Nonlinear waves: stability vs turbulence”, GeorgiaTech.  
 Conference “Linear and Nonlinear Wave Phenomena: Stability, Propagation of Regularity and Turbulence”, Cortona, Italy.  
 FRG Conference, U. Chicago.  
 Colloquium, U. Albany.
- 2019 Conference “Advances in Dispersive Equations: Challenges & Perspectives”, Banff.  
 PDE seminar UCAD, Dakar, Senegal.  
 SCAPDE, U.C. San Diego.  
 Colloquium, UMichigan.  
 Analysis seminar, Courant, NYU.
- 2020 Conference “Dynamics in Geometric Dispersive Equations and the Effects of Trapping, Scattering and Weak Turbulence, Banff.  
 Analysis seminar, UIC.  
 Analysis seminar, UMass, Amherst.  
 PDE seminar, MIT.  
 PDE seminar on Zoom.  
 MU-MST Joint Analysis Seminar.  
 Workshop on Free Surface Hydrodynamics, Fields institute, Toronto.  
 Colloquium, UVa.
- 2021 AMS sessional conference on “Nonlinear Wave Equations, General Relativity, and Connections to Fluid Dynamics”, Providence.  
 Fellows seminar, CY-advanced studies.  
 AGM seminar, CY.  
 New Mechanisms for Regularity, Singularity, and Long Time Dynamics in Fluid Equations, Banff.
- 2022: Frontiers in analysis of kinetic equations, Isaac Newton Institute, Cambridge.  
 Long Time Behavior and Singularity Formation in PDEs-Part IV, NYU Abu-dhabi.  
 PDE seminar, U. Victoria.  
 Conference in Honor of J. Ginibre, Orsay, France.  
 Workshop “Nonlinear Waves and Dispersive Equations”, Oberwolfach.  
 Conference “When Kinetic Theory meets Fluid Mechanics”, ETH Zurich.  
 Analysis seminar, MIT.  
 Analysis seminar, UCSD.
- 2023: Analysis seminar, Princeton U.  
 Colloquium, U. Toronto.  
 Cargese meeting, Corsica.

**Invitations in other departments:**

- 2007: Scuola normale superiore di Pisa.  
 Brown University.  
 ETH Zurich.
- 2009: MIT.  
 UW, Madison.
- 2010: Université de Tunis.

UMinn, Minneapolis.  
Iapcm, Beijing.  
UCLA, Los Angeles.  
2011: Princeton University.  
Peking University.  
2012: Princeton University.  
Peking University.  
2014: HIM, Bonn.  
2015: MSRI, Berkeley.  
2016: U. Cergy.  
IHES, Bures sur Yvettes.  
2018: ENS Paris.  
2021: CY-advanced studies.  
ENS Paris.  
2022: U. Zurich.