

Curriculum Vitæ

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French citizen.

Born October 25, 1983.

EDUCATION & QUALIFICATIONS

2021: Habilitation degree at Université de Rennes 1.

Many Models for Water Waves. A unified theoretical approach.

2008–2011: Ph.D. Thesis in Applied Mathematics at École Normale Supérieure de Paris.

Internal waves in oceanography and photonic crystals. A mathematical approach.

Under the supervision of David Lannes.

2007–2008: Master Degree in Applied Mathematics at Université Bordeaux 1.

2006–2007: Passed the Agrégation de Mathématiques.

2004–2008: Student at the École Normale Supérieure de Lyon.

EMPLOYMENT HISTORY

2013–present: Chargé de Recherche CNRS

Institut de Recherche Mathématique de Rennes, France.

2011–2012: Chu Assistant Professor of Applied Mathematics

Department of Applied Physics and Applied Mathematics, Columbia University, New York.

PUBLICATIONS

- [1] *Asymptotic shallow water models for internal waves in a two-fluid system with a free surface*, SIAM J. Math. Anal. **42**(5), pp. 2229–2260 (2010). [doi](#)
- [2] (with J. Marzuola et M.I. Weinstein) *Wave operator bounds for 1–dimensional Schrödinger operators with singular potentials and applications*, J. Math. Phys., **52** (2011). [doi](#)
- [3] *Boussinesq/Boussinesq systems for internal waves with a free surface, and the KdV approximation*, M2AN Math. Model. Numer. Anal., **46**, pp. 145–185 (2012). [doi](#)
- [4] (with M.I. Weinstein) *Scattering, homogenization and interface effects for oscillatory potentials with strong singularities*, Multiscale Model. Simul., **9**, pp. 1017–1063 (2011). [doi](#)
- [5] *Asymptotic models for the generation of internal waves by a moving ship, and the dead-water phenomenon*, Nonlinearity, **24**, pp. 2281–2323 (2011). [doi](#)
- [6] (with I. Vukićević and M.I. Weinstein) *Scattering and localization properties of highly oscillatory potentials*, Comm. Pure Appl. Math. **67**(1), pp. 83–128 (2014). [doi](#)
- [7] *Decoupled and unidirectional asymptotic models for the propagation of internal waves*, Math. Models Methods Appl. Sci. **24**(01), pp. 1–65 (2014). [doi](#)
- [8] (with I. Vukićević and M.I. Weinstein) *Homogenized description of defect modes in periodic structures with localized defects*, Commun. Math. Sci. **13**(3), pp. 777–823 (2015). [doi](#)
- [9] (with S. Israwi and R. Talhouk) *A new fully justified asymptotic model for the propagation of internal waves in the Camassa-Holm regime*, SIAM J. Math. Anal. **47**(1), pp. 240–290 (2015). [doi](#)
- [10] *On the rigid-lid approximation for two shallow layers of immiscible fluids with small density contrast*, J. Nonlinear Sci. **24**(4), pp. 579–632 (2014). [doi](#)
- [11] (with N. Raymond) *Spectral asymptotics of a broken δ -interaction*, J. Phys. A: Math. Theor., **47** (2014). [doi](#)
- [12] (with I. Vukićević and M.I. Weinstein) *Oscillatory and localized perturbations of periodic structures and the bifurcation of defect modes*, SIAM J. Math. Anal., **47**(5), pp. 3832–3883 (2015). [doi](#)
- [13] (with S. Israwi and R. Talhouk) *A new class of two-layer Green-Naghdi systems with improved frequency dispersion*. Stud. Appl. Math., **137**(3), pp. 356–415 (2016). [doi](#)
- [14] *The multilayer shallow water system in the limit of small density contrast*. Asymptot. Anal., **98**(3), pp. 189–235 (2016). [doi](#)
- [15] (with N. Raymond) *Spectral asymptotics for the Schrödinger operator on the line with spreading and oscillating potentials*, Doc. Math., **23**, pp. 599–636 (2018). [doi](#)
- [16] (with S. Israwi) *Well-posedness of the Green-Naghdi and Boussinesq-Peregrine systems*, Ann. Math. Blaise Pascal, **25**(1), pp. 21–74 (2018). [doi](#)
- [17] (with D. Nilsson and E. Wahlén) *Solitary wave solutions to a class of modified Green-Naghdi systems*, J. Math. Fluid Mech. **20**(3), pp. 1059–1091 (2018). [doi](#)

- [18] *Rigorous justification of the Favrie-Gavrilyuk approximation to the Serre-Green-Naghdi model*. *Nonlinearity*, **32**, pp. 3772–3797 (2019). [doi](#)
- [19] (with L. M. Rodrigues) *Large-time asymptotic stability of Riemann shocks of scalar balance laws*. *SIAM J. Math. Anal.*, **52**(1), pp. 792–820 (2020). [doi](#)
- [20] (with T. Iguchi) *A Hamiltonian structure of the Isobe-Kakinuma model for water waves*. *Water Waves*, **3**(1), pp. 193–211 (2021). [doi](#)
- [21] (with C. Klein) *Numerical study of the Serre-Green-Naghdi equations and a fully dispersive counterpart*. *Discrete Contin. Dyn. Syst. Ser. B*, **27**(10), pp. 5905–5933 (2022). [doi](#)
- [22] (with L. M. Rodrigues) *Stability and instability in scalar balance laws: fronts and periodic waves*. *Anal. PDE.*, **15**(7), pp. 1807–1859 (2022). [doi](#)
- [23] (with T. Iguchi) *A mathematical analysis of the Kakinuma model for interfacial gravity waves. Part I: Structures and well-posedness*. *Ann. Inst. H. Poincaré Anal. Non Linéaire* (2023). [doi](#)
- [24] (with B. Melinand) *Rectification of a deep water model for surface gravity waves*. *Pure Appl. Anal.*, **6**(1), pp. 73–128 (2024). [doi](#)
- [25] (avec T. Iguchi) *A mathematical analysis of the Kakinuma model for interfacial gravity waves. Part II: Justification as a shallow water approximation*. *Proc. Roy. Soc. Edinburgh Sect. A.*, First view (2024). [doi](#)
- [26] (with R. Bianchini) *On the hydrostatic limit of stably stratified fluids with isopycnal diffusivity*. To appear in *Comm. Partial Differential Equations*. Preprint available [here](#).

PREPRINTS

- [27] (with M. Adim and R. Bianchini) *Relaxing the sharp density stratification and columnar motion assumptions in layered shallow water systems*. Preprint available [here](#).

PROCEEDINGS AND NOTES

- [a] (with S. Israwi and R. Talhouk) *Shallow water asymptotic models for the propagation of internal waves*, *Discrete Contin. Dyn. Syst. Ser. S* **7**(2), pp. 239–269 (2014). [doi](#)
- [b] *A note on the well-posedness of the one-dimensional multilayer shallow water model*. Available only as a preprint, [on HaL](#) (2013).
- [c] *Stability and instability of traveling wave solutions to scalar balance laws*. *RIMS Kôkyûroku* No.2155 (2020).
- [d] *Shallow-water asymptotic models for water waves*, Master class lecture notes, available [here](#) (2020).
- [e] *Many Models for Water Waves*, Habilitation memoir, available [here](#) (2021), and also as [AMS Open Math Notes](#).

NUMERICAL PACKAGE

[#] (with P. Navaro) `WaterWaves1D.jl`, Julia package, v0.1.0 (2022). [Documentation](#). [doi](#)