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

- 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 deadwater 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 41(2), pp. 257–315 (2024). 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] (with 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. Comm. Partial Differential Equations, 49(5-6), pp. 543–608 (2024). doi

PREPRINTS

[27] (with M. Adim and R. Bianchini) Relaxing the sharp density stratification and columnar motion assumptions in layered shallow water systems. To appear in Comptes Rendus Mathématique. 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