Research interests:
Nonlinear partial differential equations and their applications

Degenerate diffusion, higher order equations, reaction diffusion equations, heat flow of harmonic maps, pseudo-parabolic equations, singularities of solutions, discontinuous solutions, measure-valued solutions, nonuniqueness phenomena, first order conservation laws, free boundary problems, travelling wave solutions

Applications to fluid mechanics (flows in porous media, hydraulic fracturing, thin liquid films, turbulent flows, hurricanes...) and biology (Alzheimer's disease...)

Publications in international journals

89. M. Bertsch, B. Franchi, L. Meacci. M. Primicerio, M.C. Tesi, *The amyloid cascade hypothesis and Alzheimer's disease: a mathematical model.* To appear in European J. Applied Math.

88. M. Bertsch, F. Smarrazzo, A. Tesei, *On a class of forward-backward parabolic equations: formation of singularities.* J. Diff. Equations **269** (2020), 6656-6698.

87. M. Bertsch, F. Smarrazzo, A. Terracina, A. Tesei, *Signed Radon measure-valued solutions of flux saturated scalar conservation laws.* Discrete and Continuous Dynamical Systems **40** (2020), 3143-3169.

86. M. Bertsch, D. Hilhorst, H. Izuhara, M. Mimura, T. Wakasa, *A nonlinear parabolic-hyperbolic system for contact inhibition and a degenerate parabolic Fisher KPP equation.* Discrete and Continuous Dynamical Systems **40** (2020), 3117-3142.

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84. M. Bertsch, H. Izuhara, M. Mimura, T. Wakasa, *Standing and travelling waves in a parabolic-hyperbolic system.* Discrete and Continuous Dynamical Systems **39** (2019), 5603-5637.

83. M. Bertsch, L. Giacomelli, A. Tesei, *Measure-valued solutions to a nonlinear fourth-order regularization of forward-backward parabolic equations.* Siam J. Math. Analysis **51** (2019), 374-402.

82. M. Bertsch, F. Smarrazzo, A. Terracina, A. Tesei, *A uniqueness criterion for measure-valued solutions of scalar hyperbolic conservation laws.* Rendiconti Lincei – Matematica e Applicazioni **30** (2019), 137-168.

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