Taiyang Xu

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EDUCATION

Fudan University, Shanghai, China — Sept, 2019 – Present
Ph.D. Candidate in Mathematics, supervised by Prof. Engui Fan and Prof. Lun Zhang
Thesis title: "TBA"

CUMT, Xuzhou, Jiangsu Province, China — Sept, 2015 – June, 2019
(CUMT represents "China University of Mining and Technology")
B.Sc. in Mathematics, Distinguished Honor, supervised by Prof. Shoufu Tian
Thesis title: "Inverse scattering theory and integrability on several kinds of nonlinear evolution equations"

RESEARCH INTERESTS

I'm an analyst who works in the area of mathematical physics and applied mathematics. In particular, I'm interested in:

- Integrable systems (IS) which admit Lax representation. I'm mainly concerned about the long-time behavior of nonlinear partial differential equations, e.g. nonlinear Schrödinger (NLS) equation, modified Kortweg-de Vries (mKdV) equation, modified Camassa-Holm (mCH) equation.
- Random matrix theory (RMT), Orthogonal polynomials (OPs) and related Fredholm determinant.
- Riemann-Hilbert problem which is the main tool used by me to study physically meaningful quantities arising in the field of RMT or IS, in particular their asymptotics associated to special functions and Painlevé family equations.

PUBLICATIONS

Preprints

- (with Y. Yang and L. Zhang) On the Cauchy problem of mCH equation: long-time asymptotics in Painlevé regions and collisionless shock region, in preparation.
- (with E. Fan) On the Cauchy problem of defocusing mKdV equation: long-time asymptotics with step-like initial data, submitted, 2022.
- (with Z. Zhang and E. Fan) On the Cauchy problem of defocusing mKdV equation with finite density initial data: long-time asymptotics in soliton-less regions, submitted, 2021.
- (with Z. Zhang and E. Fan) Soliton resolution and asymptotic stability of N-soliton solutions for the defocusing mKdV equation with finite density type initial data, submitted, 2021.

Published papers

- (with E. Fan) Large-time asymptotics to the focusing nonlocal modified Kortweg-de Vries equation with step-like boundary conditions, to appear at Studies in Applied Mathematics. (DOI: 10.1111/sapm.12568)
- (with S. Tian and W. Peng) Riemann-Hilbert approach for multisoliton solutions of generalized coupled fourth-order nonlinear Schrödinger equations, Mathematical Methods in the Applied Sciences, (43) 2020, 865-880. (DOI: 10.1002/mma.5964)

TEACHING ACTIVITIES

My teaching activities are presented as follows:

- Teaching Assistant (TA) of MATH120021.02. Calculus A, Fudan University, Fall, 2021.
- Teaching Assistant (TA) of MATH120004.01 (Online). Calculus B, Fudan University, Spring, 2020.
- Teaching Assistant (TA) of MATH120003.01. Calculus B, Fudan University, Fall, 2019.

EVENTS AND CONFERENCES

Events and Conferences are selected as follows:

- Random Matrix EurAsia 2022, Institute for Mathematical Sciences (IMS), National University of Singapore, Singapore, 18 April–13 May, 2022.
- The 13th Hemudu Forum and Seminar on Frontier Issues of Integrable Systems, Ningbo University, Ningbo, China, 15–17 Oct, 2021.

LANGUAGES

- Chinese (native speaker, include mandarin and Sichuan hua)
- English
- Germany (beginner)

OTHER INTERESTS

- Football. I'm a super fan of Manchester United (UK) and FC Barcelona (Spain). My favorite football player is Lionel Messi (Argentina).
- Basketball. I enjoy the teamwork of the Golden State Warriors (a basketball team associated to NBA, USA) and I like "Chef" Curry's playing style.
- Movies. Woody Allen (Midnight in Paris …), Ang Lee (Eat Drink Man Woman, Pushing Hands …), Richard Linklater (Before sunset/sunrise/midnight …), Quentin Tarantino (Kill Bill, The Hateful Eight …), Edward Yang (Yi yi, A Brighter Summer Day …), ……

March 20, 2023