Yijing Wu

Department of Mmathematics The University of Texas at Austin Email: yijingwu@math.utexas.edu web.ma.utexas.edu/users/yijingwu

EDUCATION

The University of Texas at Austin Ph. D. in Mathematics Advisor: Professor Luis A. Caffarelli

Shanghai Jiao Tong University B.S. in Mathematics Advisor: Professor Lihe Wang Austin, TX, United States 2014-Current

> Shanghai, China 2010-2014

RESEARCH EXPERIENCE

My research interests focus on analysis in partial differential equations and calculus of variations. I am working on problems of regularity of non-local operators, free boundary problem of fractional Laplacian and parabolic free boundary problem like Stefan problem.

- Fractional k-Hessian operators: An analogue of fractional k-Hessian operators can be defined as concave envelopes of fractional linear operators. Under the set up of global solutions prescribing data at infinity and global barriers, the solutions are Lipschitz continuous and semiconcave. I have also proved the fractional 2-Hessian operator is strictly elliptic, and the nonlocal Evans-Krylov theorem improves the regularity of solutions from $C^{1,1}$ to $C^{2s+\alpha}$. (Manuscripts under review)
- A non-local one-phase free boundary problem from obstacle to cavitation: The problem can be considered as an intermediate case of the fractional cavitation problem and the fractional obstacle problem. I have proved that the blow-up near each free boundary point is homogeneous, and flat free boundary is $C^{1,\theta}$ when the problem is close to the fractional cavitation problem. (Manuscripts under review)
- A non-local Stefan problem: I am working on a Stefan problem which describes a sublimation process of ice melting into air directly. The temperature and the air-ice interface are the two unknowns in the problem. The temperature u solves a nonlocal parabolic equation when it is positive, and the boundary moves in the normal direction at the speed of $-u_{\nu}$. The aim is to prove the existence and uniqueness of the solution, and regularity property of the solution and the free boundary. (Current project)

AWARDS AND FELLOWSHIPS

- College of Natural Sciences Deans Excellence Fellowship, 09/2014-08/2016
- Frank Gerth III Graduate Excellence Award, 2015-2016
- The Graduate Continuing Bruton Fellowship, 2018

PUBLICATIONS

- Yijing Wu. Fractional analogue of k-Hessian operators. Submitted. Preprint ArXiv: 1709.02550
- Yijing Wu. A non-local one-phase free boundary problem from obstacle to cavitation. Submitted. Preprint ArXiv: 1810.05535

TEACHING EXPERIENCE

• Teaching Assistant. M408D: Sequences, Series and Multivariable Calculus, Spring 2017

SERVICE

• Member of the Distinguished Women in Mathematics Lecture Series organizing committee, Aug 2016-Current