The College of Arts & Sciences
Department of Mathematical Sciences

Candidate Colloquium

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University of Michigan

Thursday, January 24th
Room 6132, Edwards Center 1
1:30 – 2:30 pm

What do Riemann-Hilbert problems tell us about nonlinear waves?

Riemann-Hilbert problems provide a powerful analytical tool to study various problems in pure and applied mathematics. In particular, they provide analogues of integral representations for solutions of integrable nonlinear wave equations (e.g. the Korteweg-de Vries equation), from which we can extract detailed information about the wave field with the aid of nonlinear asymptotic analysis methods. This framework leads also to a powerful method for numerical solution of the Cauchy problem. In this talk, I will describe the role of Riemann-Hilbert problems in studying solutions of nonlinear wave equations and discuss recent results obtained using this approach. One example will be on formation of rogue waves, which are large disturbances of the sea surface that appear out of nowhere and disappear just as suddenly.

Refreshments will be served 2:45-3:15 pm in the Faculty & Graduate Student Lounge Room 4118 French Hall West

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