



WPI HAROLD J GAY LECTURE SERIES



PDEs and Fractals • Geometry with its applications has been at the heart of the development of partial differential equations and boundary value problems since the very beginning. In physics, biology, economics, and other applied fields, a variety of new problems are now emerging that display unusual geometrical, analytical and scaling features, possibly of fractal type. The objective of these lectures is to acquire the view of outstanding mathematicians on the subject of differential equations and fractals, and their developments and applications, in a broad perspective encompassing both classical highlights and contemporary trends.

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Looking at 2 Spheres in R^3 with a Morse Theoretic Perspective

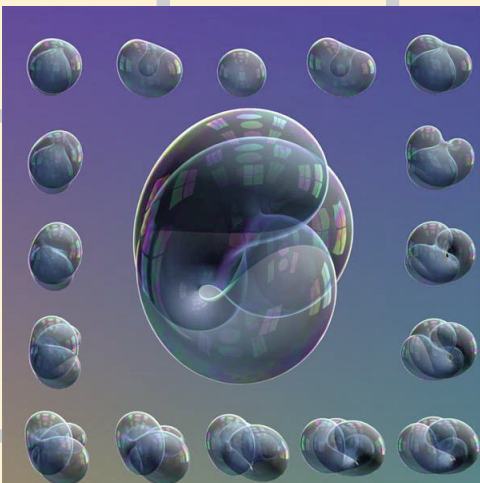
Friday, November 15, 2019

4:00pm, Washburn Shops, Room 229

In their attempt to generalize Euler elastic theory of beams to flexible membranes, Sophie Germain and Siméon Poisson introduced, two centuries ago, a lagrangian that has now become a mathematical object whose study goes a way beyond the mechanics of bent surfaces. The so-called Willmore Lagrangian is a functional that shows up in many areas of science, such as conformal geometry, general relativity, cell biology, optics, etc. • We will try to shed some light on

the universality of this Lagrangian. One remarkable fact is a quantization phenomenon of the Willmore critical spherical membranes, which happen to have all integer valued energy.

• We will then present the project of using the Willmore energy as a Morse function for studying the fascinating space of immersed 2-spheres in the Euclidian 3-space and relate topological obstructions in this space to integer values and minimal surfaces.



Sponsored by WPI and hosted by the Department of Mathematical Sciences

Refreshments available before the lecture • Participation of faculty and students is most welcome

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Poster Organization: Rhonda Podell