

## Abstracts

Niels Dencker

### **Pseudospektra för differentialoperatorer**

The pseudo-spectra of non-selfadjoint operators is a topic of current interest in applied mathematics. In fact, for non-normal operators the resolvent could be very large far away from the spectrum, which makes numerical computation of eigenvalues impossible. The occurrence of "false eigenvalues" is due to the existence of quasi-modes, i.e., approximate local solutions to the eigenvalue problem. The quasi-modes appear since the Nirenberg-Treves condition ( $\Psi$ ) is not satisfied anywhere for topological reasons. (Joint work with J. Sjöstrand and M. Zworski.)

Judy Grabiner

### **It's All for the Best: Searching for Perfection with Mathematical Models**

This talk asks, "How it is that scientists have come to look for natural laws involving the shortest path, the minimum time, the 'least action,' the 'optimal outcome?'" Examples will range from optics to classical mechanics, with the mathematics ranging from geometry to the calculus of variations. The history will range from antiquity to the 19th century. The story we tell will involve philosophical considerations as well as important mathematical physics.

Sandy Grabiner

### **Convolution Algebras on $\mathbf{R}^+$**

The classical convolution algebra is  $L^1(\mathbf{R}^+)$  which, as a convolution algebra, is related to the Laplace transform. The analogous weighted convolution algebras arise in the study of semigroups of operators and as an important class of Banach algebras. The first substantial results on these algebras were given around 1970 by Yngve Domar of Uppsala and Graham Allan of Cambridge, and the long-open natural question raised by their papers has just been solved by Charles Read of Leeds. We will survey results on closed ideals, which are the same as translation invariant subspaces; on convergence theorems, which relate to summability kernels; and on homomorphisms, which are related to semigroups.

Steen Markvorsen

### **With a View and an Outlook on to Web-borne Mathematics**

Is there a bright future for web-borne mathematics? There is - but we have to work for it. Based on concrete examples and experiences, this talk will outline and discuss some of the richest benefits to go for and some of the hardest problems to solve in connection with 'on-line' mathematics. The discussion will be centered around the familiar double golden thread:

- (1) The processing of a research manuscript (from preprint to acceptance into a good journal).
- (2) The publication and presentation of the paper and of the journal (from a flat text to an enriched string in a multi-functional database).