Svenska Matematikersamfundets årsmöte
i Lund 13 juni 2014

Fredagen den 13 juni 13:10 i hörsal C i matematikhuset.

Program

13:10 Välkomna

13.15-14:00 Elizabeth Wulcan (Göteborg): *Nonproper intersection theory and generalized cycles.*

14.10-14.55 Tomas Persson (Lund): *Presentation av årets Abelpristagare: Yakov G. Sinai.*

15:00-15.30 Kaffe och smörgås

15:30-16:15 Erik Wahlén (Lund): *Solitary water waves in three dimensions.*

16:25-16:55 Jeff Steif (Göteborg): *Presentation av årets Wallenbergpristagare: Fredrik Viklund*

16:55 - 17:00 Prisutdelning

17:00 - Medlemsmöte

18:30 - Middag

Sammanfattningar

Tomas Persson (Lund): *Presentation av årets Abelpristagare: Yakov G. Sinai.*
Sammanfattning: Sinai har haft stort inflytande på teorin för dynamiska system. Jag kommer att förklara några av hans bidrag, varigenom begrepp såsom entropi, ergodicitet, Gibbs-mått, biljarder och annat kommer att tas upp. Inga förkunskaper krävs.

Erik Wahlén (Lund): *Solitary water waves in three dimensions.*

Sammanfattning: The theory of solitary water waves goes back to the famous observation of John Scott Russell of the "Wave of Translation" on the Union Canal in Scotland in 1834. This observation was later given a mathematical explanation in terms of PDEs by Lord Rayleigh, Boussinesq, Korteweg and de Vries and others. Russell's solitary wave is two-dimensional in the sense that the only motion is in the vertical direction and the direction of propagation, the surface shape being uniform in the perpendicular horizontal direction. A natural question is whether there exist travelling water waves which are localised in all horizontal directions. I will describe what is currently known about this question in the context of the Euler equations with a free boundary. The answer depends on whether one includes surface tension in the problem or not, and how strong the surface tension is. In the absence of surface tension there is a negative result, whereas positive results have recently appeared for water waves with surface tension. These existence results rely on variational methods.

Elizabeth Wulcan (Göteborg): *Nonproper intersection theory and generalized cycles.*

Sammanfattning: I will discuss a joint work in progress with Mats Andersson, Dennis Eriksson, Håkan Samuelsson Kalm, and Alain Yger, which aims at giving an analytic approach to nonproper intersection theory.

Given two analytic cycles Z and W that intersect properly, there is a nice analytic interpretation of their intersection cycle as the product $[Z] \wedge [W]$ of the currents of integration along Z and W.

To deal with the nonproper case we introduce a class of currents that we call generalized cycles and that contains all analytic cycles. Each generalized cycle has a well-defined multiplicity at each point and a well-defined degree. The intersection of two (generalized) cycles Z and W is a generalized cycle $Z \bullet W$ whose degree satisfies Bezout's theorem. Moreover the multiplicities of $Z \bullet W$ are the local intersection numbers in the sense of Tworzewski, Achilles-Manaresi, and Gaffney-Gassler.