Analysis day in memory of Mikael Passare

September 15, 2021

Stockholms universitet

Organizers:
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ANALYSIS DAY IN MEMORY OF MIKAEL PASSARE

SEPTEMBER 15, 2019

DEPT. OF MATHEMATICS, STOCKHOLM UNIVERSITY

Program

12:00-13:00 **Lunch** at restaurant *Kräftan*

Rum 14, Building 5, Kräftriket

https://stockholmuniversity.zoom.us/j/69426041151

13:15–14:00 Alain Yger:
Ronkin's and Crofton's formulae, as I learned from Mikaël

14:15–15:00 Yves Meyer:
Spikes and waves.

Coffee break

15:30–16:15 Christer Oscar Kiselman:
A study of two explanations in the general theory of relativity

16:20–16:40 Andrei Khrennikov:
Our last discussion with Mikael: on foundations of quantum mechanics

Visit to *Norra begravningsplatsen*


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Abstracts

A study of two explanations in the general theory of relativity

Christer Oscar Kiselman
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Light rays passing close to the sun are deflected. This phenomenon was predicted by Einstein in his general theory of relativity. A comparison of statements proposed as explanations for the deflection reveals a contradiction.

Our last discussion with Mikael: on foundations of quantum mechanics

Andrei Khrennikov,
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The last time when I met Mikael we went to Fridays at Kungsträdgården and after a few recollections about our student-life at Moscow State University, he asked me about my research and I started to speak about quantum foundations supported by his curiosity and questions. We spoke about such mystical things as quantum nonlocality and spooky action at the distance. I shall briefly present these topics, their relation to the Bell inequality, experimental tests, and quantum computing.

Spikes and waves

Yves Meyer
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An atomic measure on $\mathbb{R}^n$ is a crystalline measure if it is supported by a locally finite set and if its distributional Fourier transform is also supported by a locally finite set. Crystalline measures were introduced in 1959 by Andrew Guinand, Jean-Pierre Kahane, and Szolem Mandelbrojt. Recent results show that crystalline measures play a seminal role in the following problem on Schwartz functions. One is given two locally finite sets E and F. We demand that the only Schwartz function f vanishing on E and whose Fourier transform vanishes on F be the zero function. Finally this investigation applies to the solution by Maryna Viazovska of the packing Kepler problem in dimension 8.

Ronkin's and Crofton's formulae, as I learned from Mikaël

Alain Yger
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Mikaël's so clever intuitions remained a permanent source of inspiration for more than thirty years. The purpose of my talk is to convince you they still do. I shall focus in this talk about two concepts, among so many, I got familar through him. The first one is that of *Ronkin convex function* linked with a Laurent polynomial F in n complex variables, together with its companions, each of them being attached to the p-adic absolute value (in view of the product formula) in case F has rational coefficients. The second one is *Crofton's averaging formula* (inherent to the Fubini-Study metric on the projective space), which connects multiplicative residue calculus (interpreted in terms of currents, as Mikaël learnt us how to do, in order to profit from analysis flexibility) with Bochner-Martinelli residue calculus. It appears that Ronkin function, as Mahler measure does in the projective space, is, once paired with its ultrametric companions, a marker for the logarithmic height (that is in fact the arithmetic complexity) of the algebraic hypersurface defined by F in the affine n dimensional complex torus. On the other hand, what one could call *croftonisation* makes a bridge from closed parametric formulae for Hilbert's nullstellensatz over $\mathbb{Q}$ to explicit realizations (precisely through weighted Bochner-Martinelli integral formulae), due to Mats Andersson and Elin Götmark, of Briançon-Skoda theorem in $\mathbb{C}[X_1, ..., X_n]$; it leads also to the concept of *generalized cycle (or its class)*, which archetypical examples are Segre or Stückrad-Vogel generalized cycles or their classes. My talk is based on the works of Mats Andersson, Dennis Eriksson, Håkan Samuelsson-Kalm, Elizabeth Wulcan, Martin Sombra, Alekos Vidras, Roberto Gualdi, Farhad Babaee, in which I was involved as collaborator (or, in case of Roberto and Farhad, as thesis director).