Mikael Passare In Memoriam

Christer Kiselman

At the conference *Facets of Geometry*

Stockholm University, 2013 June 03–07

2013 June 05   09:20–09:40

Earlier presentations:

Stockholm University	2011 September 28
Mid-Sweden University	2011 November 18
Nordan in Kiruna	2012 May 11
Stockholm University	2012 September 14
	Mikael Passare 1959–2011
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Apologies!

1. Introduction

Mikael Passare (1959–2011) was a brilliant mathematician. His PhD thesis from 1984 was a breakthrough in the theory of residues in several complex variables. Some time before 1998 he started to work on the theory of amoebas and coamoebas. In discussions with him during the last thirty years many questions have emerged—not all of them were resolved at the time of his premature death.

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I have published a paper in *Afrika Matematika* with the title "Questions inspired by Mikael Passare's mathematics" (published online 2012 October 27). I refer to this paper for mathematics; today I will say very little about these questions.

Mikael started his studies at Uppsala University in the fall of 1976 while still a high-school student, merely seventeen and a half. He finished high school in June 1978; gave his first seminar talk in November 1978; got his Bachelor Degree in 1979; and presented his PhD thesis at Uppsala University on December 15, 1984.

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Here is my earliest picture with him:

1983 November, Uppsala

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Mikael Passare died from a sudden cardiac arrest in Oman on September 15, 2011. He is buried not far from Sonja's grave.

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Tropical geometry has intriguing connections to digital geometry, mathematical morphology, discrete optimization, and crystallography, including the theory of quasi-crystals. I believe these connections could be further developed—I hope they will.

Mikael's PhD students

Mikael served as advisor of nine PhD students who successfully completed their degrees. They are registered in the *Mathematics Genealogy Project* and are:

Yang Xing, 1992, Stockholm University: *Zeros and Growth of Entire Functions of Several Variables, the Complex Monge–Ampère Operator and Some Related Topics*.

Mikael Forsberg, 1998, The Royal Institute of Technology: *Amoebas and Laurent Series*.

Lars Filipsson, 1999, The Royal Institute of Technology: *On Polynomial Interpolation and Complex Convexity*.

- Timur Sadykov, 2002, Stockholm University: *Hypergeometric Functions in Several Complex Variables*. Although not listed in the Genealogy Project, August Tsikh served as a coadvisor for Timur.

- Hans Rullgård, 2003, Stockholm University: *Topics in Geometry, Analysis and Inverse Problems*.

- Johan Andersson, 2006, Stockholm University: *Summation Formulae and Zeta Functions*.

- Alexey Shchuplev, 2007, Stockholm University: *Toric Varieties and Residues*. August Tsikh was second advisor.

- David Jacquet, 2008, Stockholm University: *On Complex Convexity*.

- Lisa Nilsson, 2009, Stockholm University: *Amoebas, Discriminants, and Hypergeometric Functions*. August Tsikh was second advisor.

Africa

Mikael was deeply involved in the development of mathematics in Africa: he was a member of the Board of the International Science Programme (ISP), Uppsala, and a member of the Board of the Pan-African Centre for Mathematics (PACM) in Dar es-Salaam, Tanzania. He was a driving force in the creation of this Pan-African Centre, which is a collaborative project between Stockholm University and the University of Dar es-Salaam, and was actively searching for a director of PACM.

Lineal convexity

André Martineau (1930–1972) gave a couple of seminars on lineal convexity (*convexité linéelle*) in Nice during the academic year 1967-68, when I was there. This is a kind of complex convexity which is stronger than pseudoconvexity and weaker than convexity.

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On the one hand, this piece of advice was certainly very good, for he found a lot of results in cooperation with his friends Mats Andersson and Ragnar Sigurðsson (Mikael's mathematical uncle). On the other hand, it was perhaps not such a good suggestion, for the survey just kept growing, and two preprints were circulating starting in 1991—and by then they had already been busy writing a long time.

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In the book, the authors study in detail a property which Martineau called strong lineal convexity (*convexité linéelle forte*), and which he did not characterize geometrically. This notion, in the book called $\mathbb{C}$-*convexity*, is not linked to any cleistomorphism (closure operator), since the intersection of two strongly lineally convex sets need not have the property. Therefore it has a different character, algebraically and morphologically, than lineal convexity and usual convexity.

Seminars

Mikael's gave his first seminar talk during the Fall Semester of 1978. He reported on chosen sections of the little book by Lev Isaakovič Ronkin (1931–1998), *Èlementy teorii analitičeskih funksiǐ mnogih peremennyh*, in English *The Elements of the Theory of Analytic Functions of Several Variables* (1977), which had been published in Russian in 2,700 copies in Kiev the year before and cost 93 kopecks. The task was a part of the examination for the course *Mathematics D*.

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He gave a total of 29 seminar talks over the period 1978–2010.

The *Nordan* Meetings

Together with Mats Andersson and Peter Ebenfelt, Mikael Passare initiated a series of encounters on complex analysis in the five Nordic countries. Mikael and Peter organized the first conference, which took place in Trosa, Sweden, 1997 March 14–16:

1997 March, Trosa

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Mats organized the second, in Marstrand, Sweden, 1998 April 24–26.

Mikael edited abstracts in Swedish of the lectures—which had all been given in English. These brochures were published with a delay of a few years. Twelve of them have come out; he was preparing the thirteenth, which was to report on *Nordan 13* held in Borgarfjordur in 2009, and asked Ragnar Sigurðsson on September 10, 2011, to write a preface in Icelandic (Ragnar Sigurðsson, personal communication 2011-10-04).

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Lars Filipsson emphasizes (personal communication 2011-10-06) that Mikael wrote these brochures in Swedish to develop Swedish terms in higher mathematics, especially in complex analysis—otherwise the Swedish mathematical terms reach up to the first, possibly the second, university year only.

Nordic meetings like these were something that Mikael and
Mats had discussed and planned during many years; both of
them wanted to create a forum with a more relaxed atmosphere,
where Nordic complex analysts, in particular the young ones,
could feel more at home than at big international conferences,
and which would give those that worked in the Nordic countries
occasion to get to know each other better. And the initiative
turned out to be a long-lasting success: the fifteenth encounter
took place in Röstånga in southern Sweden, 2011 May 06–08;

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An extraordinary curiosity

Andrei Khrennikov writes:

> I would like mention Mikael's extraordinary curiosity,
> which was extended to a large variety of fields. In
> particular, he discussed with excitement the possibility of
> mathematical modeling of cognition, human psychological
> behavior, and consiousness. I met Mikael and Galina the
> last time in July 2010, in Stockholm, and during one
> evening we discussed a large variety of topics: complex
> and *p*-adic analysis, mathematical foundations of quantum
> physics, quantum nonlocality, Bell's inequality and
> experiments [...] (Andrei Khrennikov, personal
> communication 2011-11-26)

A passionate traveler

Mikael was a passionate traveler. He visited 152 countries.

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Mikael was a passionate traveler. He visited 152 countries.

The United Arab Emirates and Oman turned out to be the last ones. Land number 153 should have been Iran: he planned to arrive at Tehran Imam Khomeini International Airport on September 17 at 21:25 (Mikael Passare, electronic letter 2011-09-15, the day of his death, to mathematicians in Tehran). Siamak Yassemi, Head of the School of Mathematics, University of Tehran, was ready to meet him there.

Finally

Mikael's significance goes much beyond his own research.
Many persons have testified to his positive view of life, his
humor, and to his genuine interest in people he met. He was an
unusually stimulating partner in discussions; listening,
inspiring, and supportive, in professional situations as well as
private ones.

Obituary,

Abridged Obituary,

Questions inspired by Mikael Passare's mathematics,

and other texts are available at the web site

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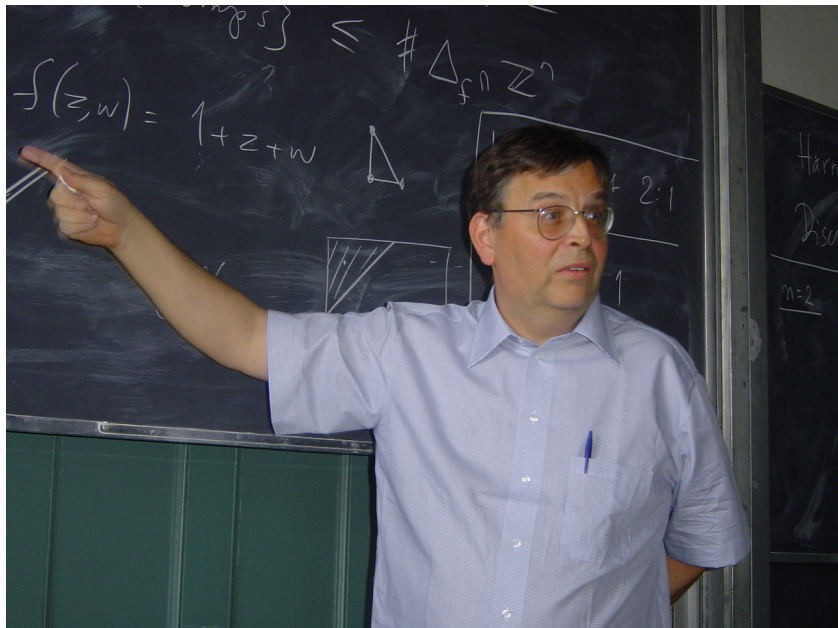**Mikael Passare In Memoriam**

Google the words

Passare Memoriam

and you will find.

2002, Toulouse

2008, Åland

2008, Institut Mittag-Leffler

2008, Institut Mittag-Leffler

2008 May, Conference in honor of Oleg Viro

2010 August 21, Hyderabad

Thank you!

2008, Åland