

Novembertaug on History of Mathematics

Laura E. Turner Mikkel Willum Johansen Uffe T. Jankvist
Henrik Kragh Sørensen

Preliminary program, book of abstracts, and information brochure
(February 17, 2010)



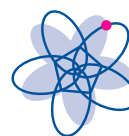
PHIS: The Danish Research Training Programme of Philosophy, History of Ideas and History of Science



Department of Science, Systems and Models (Roskilde University)



Center for the Philosophy of Nature and Science Studies (University of Copenhagen)



Department of Science Studies (University of Aarhus)

Program

Wednesday, November 05, 2008

- 17:00 **Meet and greet at Café René (Axeltorv 6)**
- 19:00 **Collecting people**
- 19:30 **Bus to Holbæk**
- 21:00 **Accommodation at Søminestationen**
- 21:30 **Presentation of participants**
- 22:30 **Drinks, music, dance, and snacks**

Thursday, November 06, 2008

- 8:00 **Registration opens**
- 8:30 **Breakfast**
- 9:30 **Presentation and discussion of the theme by the organizers**
- 11:00 **Session A (3 talks, chair: Uffe)**
- 11:00 **Andreas Christiansen:** *A controversy about geometry textbooks in Norway 1835-36*
- 11:45 **Gabriele Wickel:** *Hermeneutics as a necessary tool for analysing sources in history of mathematics?*
- 12:30 **Lunch**
- 13:30 **Daniele Molinini:** *Learning about Mathematical Explanation in physics from the History of Mathematics*
- 14:15 **Break - and grab your overcoats**
- 14:30 **Walk 'n' talk [or movie screening]**
- 16:00 **Session B (2 talks, chair: Laura)**
- 16:00 **Jantien Dopper:** *The family Van Schooten - Mathematics in the Dutch Republic in the seventeenth century*
- 16:45 **Uffe Thomas Jankvist:** *History in teaching RSA cryptography - analyzing a teaching module*
- 17:45 **Break**
- 18:00 **Dinner**
- 19:15 **Invited speaker (Jesper Lützen)**
- 20:00 **Discussion of and with invited speaker**
- 20:45 **Drinks, music, dance, and snacks**

Friday, November 07, 2008

- 8:30 **Breakfast**
- 9:30 **Session C (2-3 talks, chair: TBA)**
- 9:30 **Susanne Spies: *Mathematics as Art***
- 10:15 **Daniel Mintz: *Mapping Ptolemy***
- 11:00 **Break**
- 11:15 **Open slot**
- 12:00 **Lunch**
- 12:45 **Boarding of bus**
- 13:00 **Bus to Roskilde**
- 14:00 **Roskilde Dome**
- 15:00 **Stroll through Roskilde**
- 15:45 **Viking ship museum**
- 17:15 **Break and boarding of bus**
- 17:45 **Bus to Søminestationen**
- 18:45 **Arrival at Søminestationen**
- 19:15 **Dinner**
- 20:15 **Drinks, music, dance, and snacks**

Saturday, November 08, 2008

- 8:30 **Breakfast**
- 9:30 **Invited speaker (Henk Bos)**
- 10:30 **Break**
- 10:45 **Invited speaker (Kirsti Andersen)**
- 11:45 **Break**
- 12:00 **Lunch**
- 13:00 **Session D (2 talks, chair: TBA)**
- 13:00 **Laura Elizabeth Turner: *The Research Imperative and Swedish analysis: Mittag-Leffler and Stockholms Högskola***
- 13:45 **Jeanine Daems: *Frankenheim's discovery of the 32 crystal classes***
- 14:30 **Break**
- 14:45 **Invited workshop (Tinne Hoff Kjeldsen) part I**
- 15:45 **Walk 'n' talk [or movie screening]**
- 17:15 **Invited workshop (Tinne Hoff Kjeldsen) part II**
- 18:15 **Break**
- 18:45 **Conference dinner**
- 20:45 **Drinks, music, dance, and snacks**

Sunday, November 09, 2008

- 8:30 **Session E (1-2 talks, chair: TBA)**
- 8:30 **Henrik Kragh Sørensen:** *Romantic Equations and the Rise of Concept-Centred Mathematics*
- 9:30 **Open slot**
- 10:00 **Brunch**
- 11:15 **Evaluation, thematic discussion, and next year**
- 13:00 **Packing and leaving**
- 13:30 **Bus to Copenhagen**
- 15:00 **Conference ends in Copenhagen**

Practical information

Meet and greet On Wednesday November 5 at 17.00, we will be meeting for a *Vorabendtreffen* at *Café René*, Axeltorv 6 near the Copenhagen Central Train Station. Laura Turner will be there with a sign clearly signalling “Novembertagung”.

How to reach the organizers The organizers are: Laura Turner (mobile: +45 6068 3394), Uffe Jankvist (mobile: +45 2840 1750), Mikkel Willum Johansen, and Henrik Kragh Sørensen (+45 2425 4578).

Late arrival or early departure Participants who wish to arrive later or depart earlier can make travel arrangements to or from Holbæk Train Station where they can be picked up or dropped off.

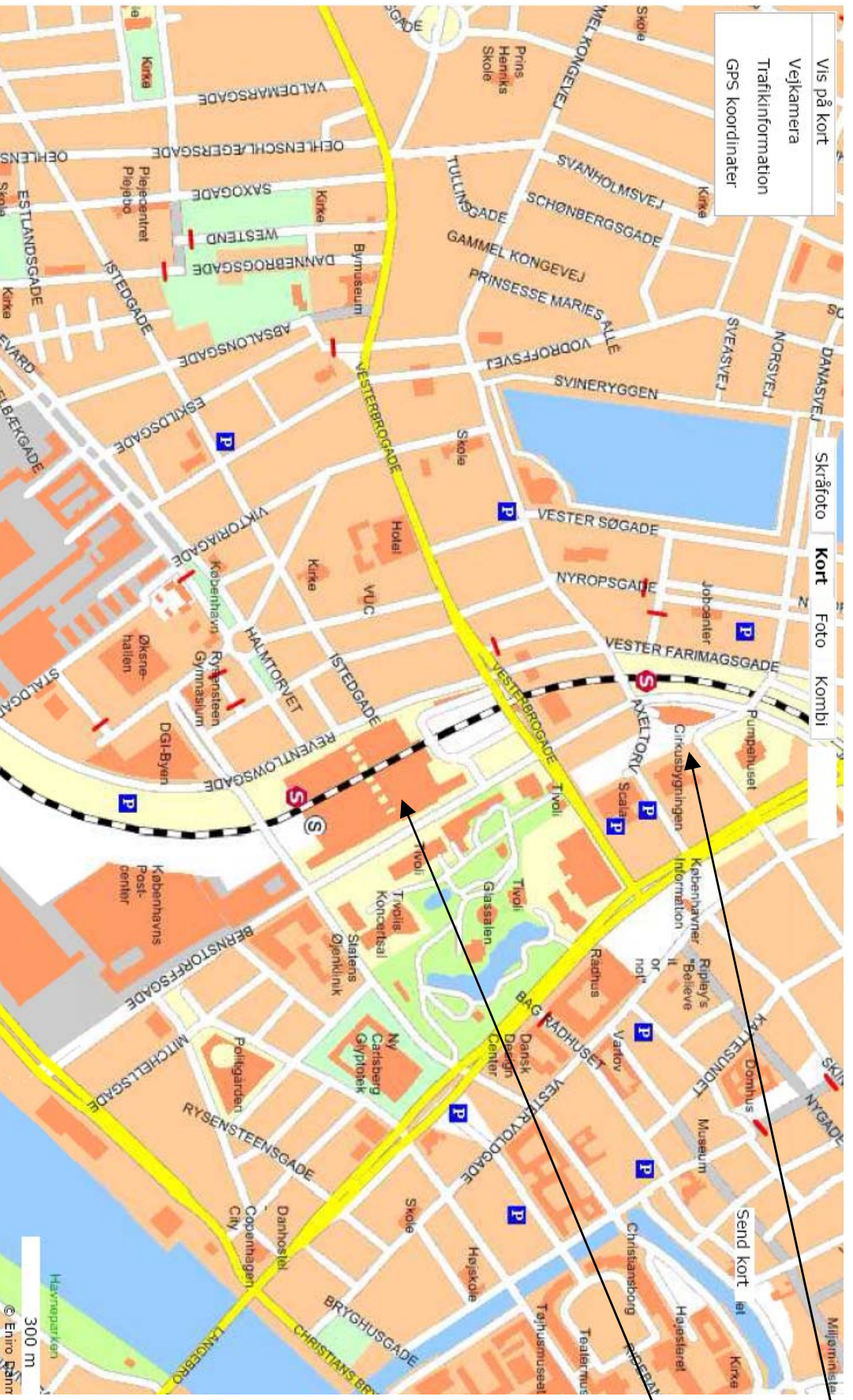
Conference fee and what it covers The conference fee of DKK 1500 (roughly equivalent to €200) covers room and board for the duration of the conference. It is to be paid in cash (Danish kroner) upon arrival. Beverages can be bought at shop-prices, so bring additional cash. There are plenty of ATM's around the Copenhagen Central Train Station and Café René at Axeltorv.

What to bring Søminestationen provides dovetts, bed linen, and towels. Bring cash (Danish kroner) to cover the conference fee and pay for your beverages.

Conference facilities Søminestationen has a computer projector, an overhead projector and (poor) blackboards. We will set up a computer with Powerpoint and PDF facilities. If you are going to use the computer projector, please bring your presentation on a CD or a USB memory stick. If you need more sophisticated software, be sure to contact the organizers in advance. Søminestationen is covered by WiFi, so if you bring a computer, you can check your email etc. Undoubtedly, some of us will, so you can also borrow access.

Arrival by air International participants flying into Kastrup Airport will find it convenient to take either a train or the metro to Copenhagen Central Train Station.

End of conference The conference ends on Sunday November 9 when all participants will be taken to the Copenhagen Central Train Station at 3.30pm.



Vis på kort
Vejkamera
Trafikinformation
GPS koordinater

Skift foto
Kort
Foto
Kombi

300 m
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Copenhagen Central
Train Station
(Hovedbanegården)

Café René
Axeltorv 6

Abstracts

Thursday, November 06, 2008, 11:00

Andreas Christiansen (Stord/Haugesund University College):

“A controversy about geometry textbooks in Norway 1835-36”

Abstract: BERNT MICHAEL HOLMBOE (1795–1850) was teacher at Christiania Kathedralskole from 1818 till 1826, and after that he was professor at the University of Christiania until his death in 1850. HOLMBOE wrote several textbooks, two of them in basic mathematics and three in more advanced mathematics, and he was probably one of the most influential persons in the development of school mathematics in the first half of the 19th century in Norway. His presentation of geometry in the books was, however, not without opposition.

CHRISTOPHER HANSTEEN (1784–1873) became teacher in applied mathematics at the university in June 1814, and he was professor from March 1816 till he retired of medical reasons in 1861. HANSTEEN was very productive, and wrote about terrestrial magnetism, northern light, meteorology, astronomy, mechanics, etc. He received international recognition after an expedition to Siberia in 1828–30 to study the geomagnetism. In 1835, HANSTEEN wrote a textbook in geometry where he challenged the traditional Euclidean geometry, and he introduced the subject matter in a very «un-Euclidean» way.

The controversy that followed in the newspapers has later been called the «dispute about parallelism». The core of it was whether one in mathematics education should – as in the case of HANSTEEN – let utilitarian considerations overrule logical deduction and theoretical thinking. Both HOLMBOE and HANSTEEN published pamphlets where they justified their views.

Thursday, November 06, 2008, 11:45

Gabriele Wickel (Siegen):

“Hermeneutics as a necessary tool for analysing sources in history of mathematics?”

Abstract: A scientific research in history of mathematics deals with different requirements. The first and easy point is, that the subject has a mathematical content and because the researcher is normally a mathematician, it is easy for him to analyse this content of his sources. However, the researcher is also interested in a special historical question within his subject. But in general he is not educated in history and the historical method. And there is a great gap between natural sciences and humanities or arts, not only in the topics, but also in the methodology. The talk will reflect my personal search for an appropriate methodology in history of mathematics. I would like to figure out my interpretation of hermeneutics in the often contradictory contexts of history and mathematics.

Thursday, November 06, 2008, 13:30

Daniele Molinini (PhD student, RESHEIS, Université Paris 7):

“Learning about Mathematical Explanation in physics from the History of Mathematics”

Abstract: In this paper I'll deal with Mathematical Explanation of Physical Phenomena (MEPP) and I'll present it in a dynamical form. In particular, starting from an article of Gingras [Gingras, 2001], I'll try to argue that one specific answer to the question “What can we learn from the history of mathematics?” is: History of mathematics can give us a better understanding of MEPP. My test-case will be Euler's Theorem on the existence of an instantaneous axis of rotation in the kinematics of rigid body motion. I start from Euler's original formulation of the theorem in E177 and I compare this one with the very different formulation we find today in a common textbook on abstract algebra. In line with an approach to explanatory structures in physics which takes into account dynamical aspects, I'll try to analyze the shift in the mathematical explanation for Euler's theorem by looking at the general concept of vector space. The different formulations of Euler's theorem could be “read” and analyzed under the light of the evolution of the concept of vector and vector space. My final point will be this: From the History of Mathematics we can learn how MEPPs change and what is the difference between two explanatory structures belonging to very different mathematical frameworks. In this sense it seems to me plausible to argue for a strict continuity between history and philosophy of mathematics.

Thursday, November 06, 2008, 16:00

Jantien Dopper (PhD Student, Utrecht University):

“The family Van Schooten - Mathematics in the Dutch Republic in the seventeenth century”

Abstract: In my paper I will present my PhD project. First I will introduce the main figures of my research: the mathematicians Frans sr., Frans jr., and Petrus van Schooten. During the seventeenth century they occupied the chair of Professor of the Engineering School attached to Leiden University. In total fifteen manuscripts of the family Van Schooten are kept in the University Libraries in The Netherlands. In this paper I will pay attention to the diverse content of a manuscript of Frans van Schooten jr.

Thursday, November 06, 2008, 16:45

Uffe Thomas Jankvist (PhD Student, Roskilde University):

“History in teaching RSA cryptography - analyzing a teaching module”

Abstract: The talk concerns empirical research in the field of integrating, or using, the history of mathematics in mathematics education. More precisely, it discusses a teaching module on the history of public-key cryptography and RSA which was implemented in a Danish upper secondary mathematics class in the fall of 2007. As part of this module the students were to write several essays illuminating different aspects of the history of public-key cryptography and RSA. One of the research questions of the talk will concern the way in which the students were able to discuss meta-aspects of this history, and if these discussions were in any way anchored in the taught and acquired mathematics of public-key cryptography and RSA.

Friday, November 07, 2008, 9:30

Susanne Spies (Siegen):

“Mathematics as Art”

Abstract: *The mathematician's patterns, like the painter's or the poet's, must be beautiful. [...] Beauty is the first test: there is no permanent place in the world for ugly mathematics.* (G. H. Hardy – ‘A Mathematicians Apology’)

Statements like this are referring to a characterisation of mathematics with aesthetic attributes often used by mathematicians and usually not shared or even understood by non-mathematicians. There is a wide range of questions concerning this observation: they are about the phenomena being observed (“Which elements of mathematics are, for example, considered to be elegant?”), the quality of judgement (“Can mathematics be beautiful or ugly - and if at all in what sense? Which concept of beauty is used?”), about the judging subjects (“Who judges under which circumstances about aesthetic aspects?”), up to the results of aesthetical decisions in a rational science. In brief: What is the nature of aesthetic experiences related to mathematics? What is special about the aesthetically treated subjects and their properties?

The subject of these questions ought to be seen in an uncommon perspective. Following Hardy again the mathematician is treated as a painter or a poet and his creation as a piece of art. From this point of view the aesthetic phenomenon called “mathematics” is supposed to be regarded on the background of the philosophy of art. Treating mathematics in this way will enlighten the aforementioned complex of questions. In special it will show how the perception of mathematical beauty is thinkable and that mathematics, from this point of view, can be seen as a special kind of art.

Friday, November 07, 2008, 10:15

Daniel Mintz (Postgraduate, University of St Andrews):

“Mapping Ptolemy”

Abstract: Almost two thousand years ago, Claudius Ptolemy created a world map, identifying the names and coordinates of over 8,000 settlements and geographical features. In Roman Britain, the locations of many of Ptolemy’s sites, such as York and the Thames, are known to us today. Many, however, still elude us. Most efforts to find and identify these hidden cities, rivers, headlands, etc. have concentrated on the etymology of modern place names, trying to work backwards in time until a match could be found with a name given by Ptolemy. Rather than looking at the names, I am focusing on the other half of the Ptolemy’s data: the coordinates. Using the data of those cities and landmarks that have already been identified, I am applying a series of best-fit transformations to Ptolemy’s map of Roman Britain. It is my hope that by "correcting" Ptolemy’s map, we can better understand the nature of Ptolemy’s sources as well as question the validity of previous identifications. New conjectures can then be made about those locations that are still lost.

Saturday, November 08, 2008, 13:00

Laura Elizabeth Turner (PhD Student, University of Aarhus):

“The Research Imperative and Swedish analysis: Mittag-Leffler and Stockholms Högskola”

Abstract: The Swedish mathematician Gösta Mittag-Leffler (1846–1927) had many of the characteristics of an “influential person”: he was politically active, wealthy, encouraging to his students, and passionate. Furthermore, he was a successful mathematician and was in touch with the upper echelon of the European mathematical community during the mid- to late-19th century. Though in recent years he has been discussed as an important organizer of mathematics, a journal editor, and to some extent a mathematician, less attention has been paid to his role as a teacher, and relatively little has been done to investigate his impact on mathematics through this area of his career. This paper thus aims to describe Mittag-Leffler’s central role in the promotion of research-level mathematics within late 19th century Sweden and the development of a research community there centered about Weierstrassian analysis and specifically Mittag-Leffler’s own work. In particular, it will discuss Mittag-Leffler’s impact on the early mathematical research of some of his first students at the newly-founded Stockholms Högskola, Ivar Bendixson (1861–1935) and Edvard Phragmén (1863–1937), whose initial works concerned Prussian mathematics directly connected to Mittag-leffler’s own. Through his definitive role in the processes of problem-selection, editing, and the ultimate diffusion of his students’ work, Mittag-Leffler effectively established a Swedish research tradition in analysis which helped to put Sweden on the mathematical map.

Saturday, November 08, 2008, 13:45

Jeanine Daems (PhD student, Universiteit Leiden):

“Frankenheim’s discovery of the 32 crystal classes”

Abstract: In the 19th century, scientists started to classify crystal structures in a mathematical way. The first classification that arose was the classification in ‘systems’. A subclassification of the systems results in what we now call the ‘crystal classes’. The 32 crystal classes have been determined (independently) several times during the 19th century, as Burckhardt and Scholz pointed out. Burckhardt (1984) rediscovered an article of Frankenheim from 1826, in which he describes the 32 ‘Ordnungen’ for the first time. I will talk about the mathematics in this article, in particular about some concepts and the method he used. Also, I will interpret his work in modern mathematics, and discuss why I think this is a sound way to deal with mathematics from an earlier century.

Sunday, November 09, 2008, 8:30

Henrik Kragh Sørensen (Associate professor, University of Aarhus):

“Romantic Equations and the Rise of Concept-Centred Mathematics”

Abstract: During the first part of the nineteenth century, mathematics underwent a number of important cognitive and institutional transformations. In this talk, I wish to illustrate and contextualise some of these transformations by contextualising a number of examples from the mathematical production of mathematicians such as N. H. Abel, C. F. Gauss, and N. Lobachevsky within the romantic period.

Many of the most famous and productive mathematicians of early nineteenth century were prototypical romantic heroes – neglected geniuses who died young, suffering the material world while studying the immaterial mathematical entities. However, the romantic influence over mathematics during that period extended well beyond the purely biographical. Especially in the Germanic romantic era, mathematics was immersed in a cultural embedding, that will allow us to discuss perspectives on romantic irony from a mathematical viewpoint.

In the first part of the nineteenth century, mathematics developed in an increasingly conceptual direction. As part of this transition, mathematicians began asking fundamentally new kinds of questions that led to new types of answers. Instead of asking for explicit formulae as results, mathematicians began to question the very possibility of such formulae. At the same time, other discoveries (such as non-euclidean geometry) led mathematicians to distance their pursuit from the investigation of nature turning it into an autonomous discipline concerned with an immaterial mathematical realm.

Since the fifteenth century, mathematicians had searched for a general formula for solving equations of all degrees. However, around 1830 and coinciding with the late romantic period, the new concept-centred approach led innovative young mathematicians such as Abel and Galois to reformulate the question in terms of “solvability” rather than “solution”. Thereby, they shifted their focus to investigating the representability within certain (restricted) formal systems yielding unforeseen results.

Participants

Andreas Christiansen	Faculty of Teacher and Cultural Education, Stord/Haugesund University College, Norway	andreas.christiansen@hsh.no
Jeanine Daems	PhD student, Mathematisch Instituut, Universiteit Leiden, Netherlands	jdaems@math.leidenuniv.nl
Jantien Dopper	PhD Student, Mathematics, Utrecht University, The Netherlands	j.g.dopper@uu.nl
Fariba Elliee	Mathematics, Bielefeld, Institut für Didaktik der Mathematik/ IDM, Germany	felliee@math.uni-bielefeld.de
Peter Götze	Master student, Mathematics and philosophy, Roskilde University, Denmark	pgoetze@ruc.dk
Uffe Thomas Jankvist	PhD Student, IMFUFA, NSM, Roskilde University, Denmark	utj@ruc.dk
Daniel Mintz	Postgraduate, Schools of Classics and Mathematics & Statistics, University of St Andrews, United Kingdom	dm433@st-andrews.ac.uk
Daniele Molinini	PhD student, History and Philosophy of Science, RESHEIS, Université Paris 7, France	dmolinini@yahoo.it
Susanne Spies	Fachbereich Mathematik, Siegen, Germany	spies@mathematik.uni-siegen.de
Henrik Kragh Sørensen	Associate professor, Department of Science Studies, University of Aarhus, Denmark	hks@ivs.au.dk
Alexandra Thalassinou	Master student, Department of Education, University of Crete (Rethymno), Greece	athalass@yahoo.gr
Laura Elizabeth Turner	PhD Student, Department of Science Studies, University of Aarhus, Denmark	silt@ivs.au.dk
Gabriele Wickel	Fachbereich Mathematik, Siegen, Germany	g.wickel@web.de