Newsletter

BELGIAN MATHEMATICAL
SOCIETY

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119, September 15, 2018

**Newsletter of the Belgian Mathematical Society
and the National Committee for Mathematics**

Contents

Dear member of the BMS,

Welcome to newsletter number 119 of the Belgian Mathematical Society and of the National Committee for Mathematics. I hope all of you had a nice and hot Summer and that you are good and ready for the new academic year.

This Summer the International Congress of Mathematicians (ICM) took place in Rio de Janeiro, Brazil. This is one of the big events in Mathematics that happens every 4 years. One of the highlights is the attribution of the Fields Medals. This time the Medalists were Caucher Birkar, Alessio Figalli, Peter Scholze and Akshay Venkatesh. You can read about these brilliant mathematicians on `https://www.mathunion.org/imu-awards/fields-medal/fields-medals-2018` but please note that the BMS will organise a **Fields Medalist Symposium** on **December 5th, 2018** in Brussels. More information about this event can be found further in this Newsletter.

A few days before the International Congress of Mathematicians it is also the tradition to have a General Assembly of the International Mathematical Union (IMU). That meeting took place in São Paulo and Belgium was represented by our colleague Freddy Dumortier, member of the National Committee for Mathematics. During this meeting Freddy was elected as chairman of the *Finance and Dues Committee* of the IMU. Congratulations Freddy!

The General Assembly also selected Saint Petersburg as location for the next ICM in 2022. It was also decided to propose to UNESCO to declare March 14th *International Day of Mathematics*. Such a recognition of π-day would be a significant boost for the public awareness of Mathematics.

As most of you know the PhD Day organised by the BMS in Gent on May 25th of this year was a big success. Especially the job fair was an interesting novelty. You can read a full report and see some photos of the event further down this Newsletter. I wish to thank the organising team for the effort they put in our 2018 edition of the PhD Day. The plan is to have our next PhD Day in 2020.

As mentioned earlier you should **save the date of December 5th, 2018** for the *Fields Medalist Symposium*. A second reason for marking this date in your diary is that the BMS will hold a General Assembly on this day. All members are invited to attend the General Assembly. A more detailed agenda of the meeting will be sent to you later but one of the important items will be the change of our by-laws and the structure of the Society. The board of the Society came to the conclusion that it is important for the Society to become a registered non-profit organisation (vzw in Dutch, asbl in French).

I hope you will enjoy this Newsletter full of interesting announcements and information. In case you have information or want to contribute to the Newsletter, please don't hesitate to contact our Newsletter editor via wendy.goemans@kuleuven.be.

Philippe Cara,
BMS president

1   News from the BMS & NCM

1.1   Report on BMS PhD Day: Your maths are made for talking

On May 25, the BMS again organized a PhD Day, where mathematics PhD students could present a poster or a talk on their research. In this way, these PhD students were invited to share their ideas and results with their fellow PhD students, and establish new contacts.

But also a new feature was added to the PhD Day. For the first time, a job fair was organized during this PhD Day. This job fair had many objectives. First of all, to bring mathematicians in contact with companies offering jobs to mathematicians, and secondly, to also show to companies that mathematicians have talent, and to encourage them to open vacancies for mathematicians.

The PhD Day started with the Godeaux lecture by Prof. Laure Saint-Raymond (École normale supérieure de Lyon), who presented a talk on *Internal waves in a domain with topography.*

Figure 1: Godeaux lecture: Prof. Laure Saint-Raymond

This was followed by a poster storm session. Every PhD student presenting a poster was asked to advertise his/her poster in a one-minute presentation.

Figure 2: Poster storm session

This was then followed by the morning poster session, where 23 posters were presented.
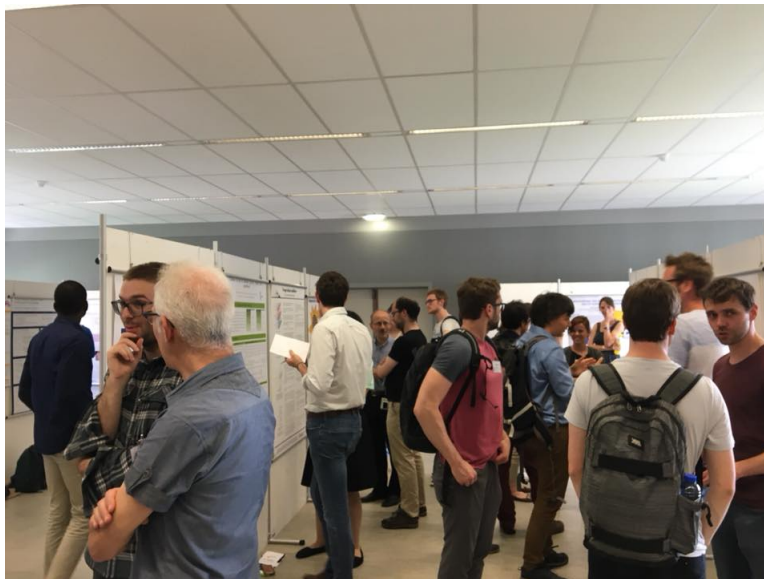

Figure 3: Poster session

After the lunch break, 7 contributed talks were given in two parallel sessions.

Then the final event started: the job fair, jointly with the second poster session. For this second poster session, we were joined by the master students of MaStat Ghent, who presented the posters of their master project.

We were very happy to see that the job fair was a great success. The 13 participating companies were: (1) AGFA Health Care, (2) Amplidata, (3) BELFIUS, (4) CluePoints, (5) Deloitte, (6) Ernst & Young, (7) Federale Overheidsdienst Financiën, (8) Itineris, (9) KBC, (10) Nationale Bank België, (11) Nuance Communications, (12) NXP, and (13) PricewaterhouseCoopers.
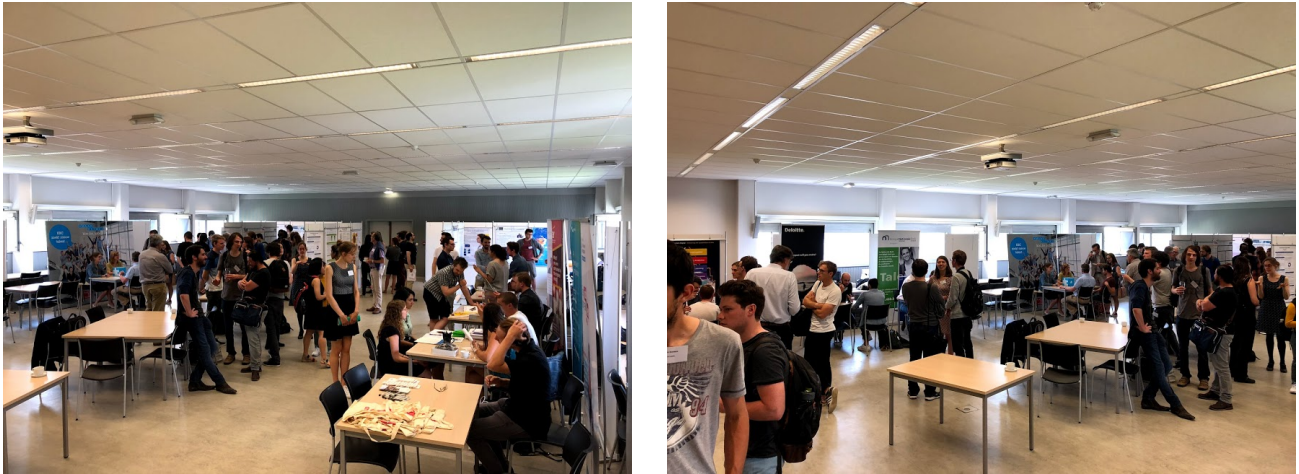
Figure 4: Job fair

A very good thing that happened at the job fair is that many of the companies sent mathematicians to present their info stand. These mathematicians working for these companies could tell to the interested participants exactly what their job vacancies and projects were.

After the job fair, the best poster award ceremony was held. A committee of five professors selected three posters for the best poster award. The third prize winner was Jozefien D'haeseleer (Ghent University), the second prize winner was Lisa Hernandez Lucas (VUB), and the first prize winner was Sam Mattheus (VUB).

The three prize winners won a drawing by Prof. Andreas Weiermann (Ghent University) and a book, and the first prize winner Sam Mattheus also won a bottle of π-wine.

Figure 5: Best poster award (from left to right): Adhemar Bultheel (KU Leuven), Jozefien D'haeseleer (Ghent University), Stefaan Caenepeel (VUB), Lisa Hernandez Lucas (VUB), Sam Mattheus (VUB)

Figure 6: Best poster award: Sam Mattheus (VUB) and a bottle of π-wine

In total, the PhD day was attended by 45 PhD students and 31 other participants.

The BMS intends to organize the next PhD Day in 2020. We explicitly intend to highlight even more the job fair, to advertise mathematicians to companies, and to stimulate companies to give jobs to mathematicians.

Sponsors
The BMS greatly acknowledges the sponsoring of the PhD Day by AGFA Health Care, PricewaterhouseCoopers, and MaStat Ghent.

Acknowledgement
The BMS thanks Prof. Els Goetghebeur, Prof. Leo Storme, Prof. Michèle Vanmaele, Prof. Jasson Vindas Diaz, and Prof. Andreas Weiermann very much for organizing the PhD Day and the job fair. The BMS also thanks Timmy Fieremans (VUB) very much for making the website for the PhD Day and job fair.

1.2   Save the date: Fields Medalist Symposium and General Assembly

Please note that on **Wednesday December 5th, 2018** the BMS will organise a **General Assembly** as well as a **Fields Medalist Symposium**.

The event will be organised at the **Université Libre de Bruxelles** and will **start at 2pm**. There will be talks by established experts about the mathematics of the four most recent Fields Medal winners. A more detailed programme will be announced soon on the BMS website.

The General Assembly of the BMS will also take place during this event. All members are invited to participate and will get a detailed agenda by e-mail.

2   News from the EMS

2.1   Message on behalf of the EMS RPA committee

We are working to the Space-Time Map of the Public Awareness Events in Europe (and beyond). This map will be a website built for the European Mathematical Society that allows browsing and filtering European math outreach events chronologically, geographically and on an interactive map. It allows users to subscribe to notifications and updates. The site will be integrated to the Mathematics in Europe `http://mathematics-in-europe.eu/` website (of the EMS) as an integrated web-app/mini-site.

As a reference please give a look at this map: `http://10years.imaginary.org/` (scrolling to the bottom of the page to see the map). The EMS database will be much more general, have an editing backend, a form to submit events, etc. but on this site one can see well how a "map calendar" works.

We are writing this message to ask your societies to contribute in a permanent way to this project by indicating one or more contact persons to update the map on regular basis. Also, you can suggest groups or organizations working in math outreach, who can be interested to send updates.

Please, send your indications and suggestion before October 31th, to roberto.natalini@cnr.it.

Many thanks!

Roberto Natalni, Chair of the Raising Public Awareness Committee of the EMS

2.2   Open calls for Mynisimposia and Satellite Conferences for 8ECM

We would like to invite you to **apply with proposals** for Minisimposia and Satellite Conferences during the 8th European Congress of Mathematics (8ECM), to be held at Portorož, Slovenia, 5-11 July, 2020.

Internal and External Satellite Conferences (SC) will be held three days prior and after the official conference program. 8ECM Organizing Committee will offer full organizational and logistic support for organizers of Internal SC, so your focus would be entirely on the scientific programme. For Minisyposia organizers, special incentives are offered.

Please review the open call at the official 8ECM website `https://www.8ecm.si/` and apply no later than the following deadlines:

- Satellite Conferences – February 1st 2019
- Minisymposia – December 1st 2019

We would also kindly ask you to forward this announcement to colleagues at your institution, you will find the official invitation in the attachment. If possible, please publish it on your institution's social media and website using this link `https://www.8ecm.si/calls`

We are looking forward to welcome you and your colleagues at the Congress and we remain available for further questions you may have at 8emc2020@famnit.upr.si.

Sincerely,

Tanja Labus, Office of Organizing Committee, 8th European Congress of Mathematics
`https://www.8ecm.si` and `http://www.famnit.upr.si/en`

3 Meetings, Conferences, Lectures, . . .

3.1 Conferences

Programme ALTAIR 2018-2019, ULB

Cycle de conférences ALTAIR 2018-2019, ULB: voir programme détaillé à la fin de la Newsletter.

3.2 Seminars

Analysis & Geometry Seminar, University of Antwerp

The "Analysis & Geometry Seminar" is the weekly research seminar of the analysis & geometry-interested people at the Mathematics and Computer Science Department of the University of Antwerp. During term, we'll have once per week a research talk in analysis and/or geometry and/or related topics. The list of speakers comprises researchers from Antwerpen as well as other universities.

This fall term, the seminar (usually) takes place on Wednesdays between 16–17h in room M.G.005 in the Building G on Campus Middelheim of the University of Antwerp. The seminar web page with the list of upcoming and previous speakers can be found here:

https://www.uantwerpen.be/nl/personeel/sonja-hohloch/private-webpage/seminars/analysis---geometry-/

3.3 September 2018

15th Belgian–Dutch Algebraic Geometry Seminar

September 20–21, 2018

Radboud Universiteit, Nijmegen

The 15th edition of the rotating Belgian–Dutch Algebraic Geometry seminar will take place at Radboud Universiteit Nijmegen, on September 20–21, in room HG00.071 of the Huygens building (Heyendaalseweg 135, 6525 AJ Nijmegen). This is a special two-day edition meant to celebrate the 50th birthday of Ben Moonen, one of the co-founders of the seminar. The schedule is as follows.

September 20

13:30–14:30	Ching-Li Chai (University of Pennsylvania) *Foliations on moduli spaces of abelian varieties*
15:00–16:00	Jörg Wildeshaus (Université Paris-Nord) *Weights and conservativity*
16:30–17:30	Kęstutis Česnavičius (CNRS & Université Paris-Sud) *Purity and the Brauer group*
18:00– . . .	Dinner party

September 21

09:30–10:30	Claire Voisin (Collège de France) *Gonality and zero-cycles of abelian varieties*
11:00–12:00	Victoria Hoskins (Freie Universität Berlin) *On the motive of the stack of vector bundles on a curve*

12:00–13:00	Lunch
13:00–14:00	Richard Thomas (Imperial College)
	Refined Vafa-Witten invariants for projective surfaces
14:30–15:30	Piotr Achinger (IMPAN, Warsaw)
	Serre–Tate theory for Calabi–Yau varieties

Participation (including all coffee breaks and lunch) is free, but registration is compulsory; however, there is a fee for the conference dinner. For more practical information, see the webpage of the event (`http://www.ru.nl/math/bdags`).
If you have any questions, please get in touch via arne.smeets@math.ru.nl.

3.4   October 2018

Arithmétique en Plat Pays / Getaltheorie in het Vlakke Land

October 1st, 2018, 11:00 – 17:30

KU Leuven department of mathematics, Celestijnenlaan 200B, Leuven

It is a pleasure to announce the Summer edition of our Arithmétique en Plat Pays / Getaltheorie in het Vlakke Land series, which will take place in Autumn, namely on Monday October 1st in Leuven. One slot remains to be filled in, but apart from that the programme is as follows:

11h00 Philip Dittmann (KU Leuven): "Recent results on diophantine definability in global fields"

12h00 Lunch

14h00 Dion Gijswijt (TU Delft): "Large subsets of $GF(q)^n$ with no three-term arithmetic progression"

15h00 Ekin Özman (Boğaziçi University): "Modular curves, rational points and diophantine equations"

16h00 Coffee break

16h30 Efthymios Sofos (MPIM Bonn) : "The size of the primes p for which a diophantine equation is not soluble modulo p"

19h00 Dinner

All talks take place in room 02.18 of Celestijnenlaan 200B in Leuven (Heverlee). Coffee and meals will be included, but registration is mandatory and can be done on our website `http://www.mathconf.org/app-gvl-summer2018`

First mini-course series "Symplectic Techniques in Differential Geometry'"

October 4, 2018, 10:30 – 16:30

KU Leuven department of mathematics, Celestijnenlaan 200B, Leuven

Three day-long events will take place in the fall semester 2018, within the framework of the EoS project "Symplectic Techniques in Differential Geometry". These mini-courses are meant to introduce the respective topics and are aimed at researchers and doctoral students. The second and third events will take place on November 23 and 29, at U. Antwerpen and ULB respectively.

The speakers for the first event are:

Sonja Hohloch (U Antwerpen): Hyperkähler Floer homology and Hamiltonian PDEs
Joel Fine (ULB): Symplectic geometry of twistor spaces

Schedule:

- 10:00: welcome coffee (room B02.04)
- 10.30-12.45 mini-course by Sonja Hohloch (room B01.16)

- 14:15-16:30 mini-course by Joel Fine (room B02.16)

To register, please contact Marco Zambon (marco.zambon@kuleuven.be).

4   PhD theses

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Bounds on Costas permutations and graphs

Jordy Vanpoucke, Vrije Universiteit Brussel
October 26th, 2018, at 17:00
Vrije Universiteit Brussel, campus Etterbeek
room: TBA

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Thesis advisor: Philippe Cara (VUB)

Summary: RADAR and SONAR systems are both used to transmit waves to detect a certain target and determine certain properties of this target, such as the distance and the velocity. The waves used in SONAR are frequency pulses that are reflected from the target. When the pulse is received back by the observer, it is shifted in both time and frequency and these shifts can be used to compute the distance from the target and the velocity of the target. While transmitting it is possible that background noise or interference with other objects will influence the received frequency pulse. For this reason one chooses to use a pattern of different frequencies within one pulse and the most effective patterns appear to be the ones that satisfy the Costas condition, id est the frequency shift between any two couples of time slots over the same time difference in the pattern must all be different.

As early as 1965 people started searching for this type of frequency patterns, also called Costas permutations, and they came up with three general constructions, the Welch Construction, the Lempel Construction and the Golomb construction. These three construction algorithms remain till now the main known construction methods, but it seems that they only cover a small fraction of all the Costas permutations, which leads us to two important open questions:

1. Are there other construction algorithms for Costas permutations?
2. Given $n \in \mathbb{N} \setminus \{0, 1\}$, does a Costas permutation of degree n exist?

A lot of work is done to find a solution for these two open problems. People tried to find new constructions by making some generalizations or extensions of the three known constructions. Other researchers tried to look at certain algebraic characteristics of the Costas permutations. Besides the known construction methods there are however not that many other tools to find new Costas permutations, except for brute force. This means that we would have to check all of the permutations and see if there is one that is Costas. Checking all permutations of degree n is however very time consuming as there are $n!$ permutations of degree n, and this number gets large very quickly. 100! gives us for example a number with 158 digits!

In this thesis we contribute to the search for new Costas permutations by introducing two tools that can be used to determine whether a permutation is Costas or not. The first tool are the so called **alternating runs**, which basically give us information on how the permutation, seen as its ordered set of images, behaves. We managed to find a theorem relating the degree n of the permutation and the number of alternating runs k in this permutation. A second tool that we used in this thesis is that of **subgraphs in Costas graphs**. More specifically we look at complete subgraphs appearing in those Costas graphs and we present several theorems in which we determine the largest possible complete subgraph in a Costas graph and an upper bound on the smallest possible complete subgraph included in all Costas graphs of given order n.

The new results in this thesis can be useful when searching for Costas permutations (graphs), as they give us specific conditions on the structure of these permutations (graphs). This information can then be used in computer programs to reduce the time needed for these programs to find new Costas permutations.

5   History, maths and art, fiction, jokes, quotations . . .

5.1   Adhemar's corner

As always to be read with great pleasure, next follow two of Adhemar's reviews!

Two historical trilogies by Dava Sobel and John Banville
1. The historical trilogy by Dava Sobel

Dava Sobel is an American popular science writer. Although never officially declared a trilogy, I will briefly discuss here her biographies of John Harrison, Galileo Galilei, and Nicolaus Copernicus.

Her first book is called *Longitude* (1995) with subtitle: *The true story of a lone genius who solved the greatest scientific problem of his time.* The 'lone genius' here is John Harrison, a self-made clock maker of the 18th century. The problem of determining the longitude was important to define the position of a ship at sea. The equator is defined by the solar system, so that there is no problem to determine the latitude of the position. The longitude is defined by human agreement and there was not a cosmic way to find the longitude of the ship. After several disasters at sea with many casualties, the British government issued the *Longitude Act* in 1714 and offered a large prize for anyone who could find a method to compute the longitude up to a certain precision. Several methods were in competition. One inaccurate method was based on measuring the difference between the magnetic pole and the true pole of the earth. Another was based on the position of the moon with respect to stars, the so called *lunar distance method*. After the observation of the latter it took a skilled person to make all the long computations to find the longitude. The method was promoted by Nevil Maskelyne who became Astronomer Royal in Greenwich. Therefore, he was *ex officio* a member of the *Board of Longitude* consisting of astronomers, admirals, and mathematicians that had to judge who should be awarded the prize. A position we should nowadays recognize as a blatant conflict of interest.

Maskelyne is the villain in this story. The hero(s) is(are) John Harrison (1693-1776) (and his son). Harrison's method was based on measuring the time difference between the position of the ship and some fixed meridian e.g. at Greenwich or Paris. This method was proposed by Gemma Frisius two centuries earlier but Newton and Huygens were doubtful about the possibility to construct a clock for that. Harrison constructed his first large (wooden) clock that could be taken on the ship in 1736: the Harrison-1 or H1. Two other models, the H2 and H3 were constructed before his masterpiece, the H4 sea watch, was realized in 1754. It looks like grandfather's pocket watch. This had to be tested on a long sea trip. However Maskelyne ordered to take away Harrison's

John Harrison with H1 behind him and H4 near his hand

clocks and notes, maltreated the instruments and stowed them away in oblivion. A replica had to be constructed to be tested and retested, Maskelyne upholding the assignment of the prize to Harrison, even though James Cook was very positive after testing the watch. When Harrison desperately complains with king George III about this injustice, he was after 40 years of struggle finally awarded his prize in 1773.

Sobel tells the story as if it were a dramatic novel, but with a lot of precise historical information. It was used as the basis for a film and a TV series with Michael Gambon as Harrison. In the book Sobel also adds an extensive part about the further evolution of clock making after Harrison died. Pictures of the clocks and the history can be found at the website of the *Royal Museums Greenwich*. Sobel also published an illustrated version of the book including many of these pictures.

In her second book *Galileo's daughter* (1999), subtitle: *A drama of science, faith and love*, she writes a biography of Galileo (1564-1642). Also this book was very successful and won the Pulitzer prize in 2000. Although Galileo was not married, he had two daughters and a son. The daughters he put in the San Matteo Convent in Arcetri. The 'daughter' of the title is Virginia, the eldest of the two, who became Suor Maria

Celeste as a nun. She was the only heir of Galileo that inherited his sharpness of mind. In fact she copied and

Suor Maria Celeste

edited some of his manuscripts. The larger part of the book is based on the surviving letters she wrote to her father, whom she usually addresses as *Most illustrious and beloved lord father* and signed *S.M.C.* Of course we learn all the historical facts. Galileo who became convinced of the Copernican system, placing the sun at the center of the solar system, which was contradicting the Bible in which Joshua commanded the sun to stand still. So he wrote several books to sustain his beliefs based on sunspots and the sea tides. In his book *Dialogue concerning the two world systems* three persons are discussing the solar system. Salvatio is defending the heliocentric system and *Simplicio* defends the earth as the center of the universe. This errancy could not be accepted by the inquistion, and although Galileo defended it as just a hypothesis, he was sentenced to imprisonment which was converted to house arrest and the book was placed on the list of forbidden books, just like the book by Copernicus before. The house arrest gave him all the time to work on his last book *Discourses and mathematical demonstrations relating to two new sciences*, which was eventually published by Lodewijk Elzevir in Leiden. It has the same form as the *Dialogue* but Simplicio is made a bit less simple.

Besides these scientific facts, Sobel also highlights Galileo as the one who had to sponsor his sisters, support the convent of his daughters, and take care of his son, in fact the whole family relies on him. Many (translated) letters and quotes of Maria Celeste and from other letters addressed to Galileo are included. Later Sobel published a book collecting the 120 original letters by S.M.C. with their translation. She also catches here well Galileo's dilemma, keeping scientific integrity while being a sincere catholic and we are confronted with Galileo's bad health condition suffering regularly of longer periods of illness during which he was unable to travel or work.
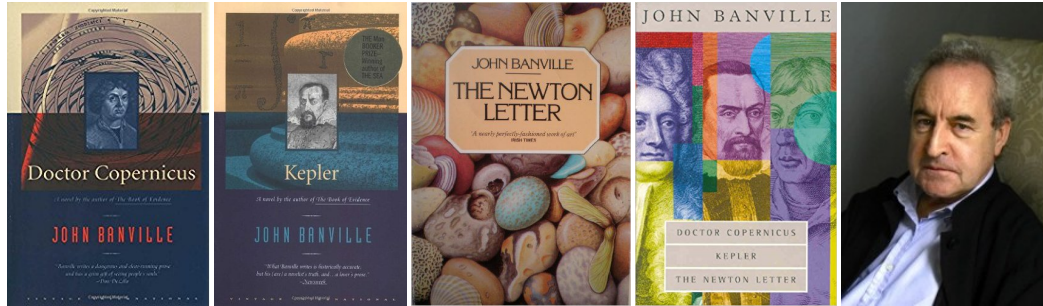
The third book *A more perfect heaven* (2011) is a biography of Mikołaj Kopernik (1463-1543) whom we know as Copernicus. Orphaned at the age of 10, he was raised under the supervision of his maternal uncle Lucas Walzenrode who became later the bishop of Varmia, and Copernicus' boss. Copernicus studied in Italy but never got his degree. He studied medicine including reading horoscopes and astrology which was part of the education. The times were turbulent with emerging Lutheranism and Teutonic Knights terrorising the Polish countryside. His uncle appointed him as his personal physician and as an administrator and as a canon of the chapter of Frombork (Frauenburg) he had to supervise the farmers who still worked in a feudal system. Mathematics and astronomy was a hobby he exercised in his free time. He wrote some notes in 1514 in which he proposed a hypothetical heliocentric solar system which he distributed among friends. He continued working on this on and off, but refrained from publishing, anxious to be ridiculed.

Joachim Rheticus was a mathematician from Wittenberg who visited Copernicus in 1539 and became his pupil for 2 years. He did everything to convince Copernicus to polish his notes and publish them as a book. Eventually Copernicus succumbed and gave the manuscript of *De revolutionibus orbium coelestium* to his friend Tiedemann Giese the bishop of Kulm who delivered it to Rheticus who had already published his own accound (*Narratio prima*) and now had to supervise the printing process in Nuremberg, Germany. However Reticus accepted a job promotion in Leipzig and passed the supervision to Andreas Osiander, a Lutheran theologian who added his own preface defending the 'new system'. Legend goes that Copernicus died the day that the first copy of his book was delivered.

Sobel tells this story in a particular way. In a first part, it starts like a classical biography but the story of his mathematical and astronomical research is interrupted by quotes from his diary that he kept as the administrator of the rural community, thus simulating that he did his mathematics in between his major task. In a second part, she writes a script for a stage play where Rheticus arrives at the residence of Copernicus with his hard set intention to convince Copernicus to publish his work with in the background the bishops of Kulm (Giesen) and of Varmia (who claims to be poisoned by protestants), and Anna, the live-in housekeeper who has a relation with Copernicus. The third part goes on with the printing process and how the work was received afterwards by other scientists like for example Galilei and Kepler.

Sobel wrote two other popular historical books: *The planets* (2005) about the solar system and her last book *The Glass Universe* (2016) about the women who worked at the Harvard Observatory somewhat paralleling several similar books of 2016 (see for example *Hidden figures* and *Rise of the rocket girls*).
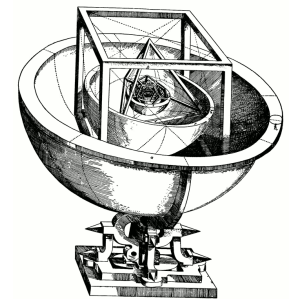
2. The historical trilogy by John Banville

John Banville is an Irish novelist who also wrote two novels based on historical facts that discuss the lives of Copernicus and Kepler and a novella *Newton's Letter*, which were bundled in the *Revolutions* trilogy.

The first one is entitled *Doctor Copernicus* (1976). Banville sketches a dark repulsive historical period with harlotry, stench, prostitution, bigotry, and political scheming. Copernicus is presented as a taciturn, sequestered loner, presumably unable to feel empathy, living in an abstract world of his own, shying away from the hostile outside world. An important role is played by Andreas, Copernicus' brother who is his extravert opposite, not good at anything and who is almost an impersonation of the devil himself. He catches a terrible disease that turns him into a disfigured atrocity. The first part is describing the youth of Copernicus told from his viewpoint. The second describes the young Copernicus who has released his first notes about his heliocentric vision in between his other duties and gains some reputation in Europe. In the third part we meet Rheticus, a self-centred cynic who as an older man tells his story how he convinced Copernicus to publish his work, but feels betrayed by Copernicus and his entourage as well as during the printing process. He feels that he had just been used to smuggle the manuscript to the Lutheran Germany. In the final part, the first copy of the book is brought to the dying Copernicus who is raving, forbidding the publication of his book, but finally meets his previously diseased brother Andreas in the afterlife.

The second book from (1981) is called *Kepler* (1571-1630). It is of course a romanticised biography of Kepler. It is not told in chronological order though. It might be helpful to read a short summary of his life and work to follow the historical events and to distinguish the fantasy of Banvill from what has happened in reality. Because, just as was the case with Copernicus, also here there is a clear difference with a proper biography. People have moods and feelings, and they have unspoken opinions. There are dialogues, spoken with a certain intonation, there are weather conditions, illness, doubts, etc. The facts are woven in between. Something about his childhood is only told in flashbacks. In his first book *Mysterium Cosmographicum* Kepler defends the Copernican system by a model of nested Platonic solids.

It made Kepler's reputation and introduced him to possible sponsors. This is where the novel starts: Kepler meets Tucho Brahe for the first time and somewhat later in 1597 he marries Barbara Müller who was 23 and widowed twice already but, most importantly, she was rich by inheritance. Also her parents were rich while Kepler was poor so that there was some reluctance from their side.

Tycho Brahe was a Danish astronomer who had the most accurate astronomical observations of his time, but he did not want to share them with anyone. Although he was opposed to the results of Kepler, they came to an agreement and Kepler started working for him. Kepler brought his family to the new observatory near Prague, but they were not well received and he was ordered to do boring observations of Mars. Brahe was working on astronomical tables ordered

Kepler's model in the *Mysterium*

by the emperor Rudolf II. When Brahe died unexpectedly, Kepler became in 1601 as his successor, the imperial mathematician. His observations of Mars became the incentive for his laws of motion of the planets. They were eventually published in his *Astronomia nova*. It forced him to leave the idea of perfect circular trajectories. After trying oval and egg-shaped versions it led him to to the elliptic version. Publishing a book was in those days not simple. One had to find sponsors and the printing itself was a laborious and time consuming process that required close supervision.

A third part of the novel is called *Diptrice* which refers to his book about optics after he learned about

Galileo's telescope. Kepler and Galileo never collaborated though. The fourth part is called *Harmonice Mundi*, a book in which Kepler iterates on the regular polytopes of the *Mysterium* and describes the so-called Kepler solids. This part of the novel consists completely of fictitious letters that Kepler addresses to diverse people. The fifth part is entitled *Somnium* (the dream). Because of changes in the political situation and an increasing pressure from Calvinist side, Kepler is moving to Linz, where he continued working on the *Rudolfian tables*. Because his wife Barbara died, he remarried in 1613 with Susanna Reuttinger. There was more dying of some of his children, his mother was brought on trial accused of whitchcraft, and Kepler, who had bad sight for most of his life was loosing his sight almost completely. All tragic events, but rather common in those days.

One might now expect in a trilogy that a third book called *Newton's Letter* (1982) is in the line of the two previous ones, a romanticized biography of Newton trying to understand the psychology of the man. However it turns out to be a novella about an historian who is unable to finish a book about Newton. He rents a cottage in the countryside hoping to finish his book in the quietness of isolation. However he gets involved with the Lawless family hiring the cottage. There is Charlotte and her husband Edward who has a drinking problem, their adopted child Michael, and Charlotte's younger niece Ottilie who is Michael's true mother. He starts a passionate relation with Ottilie, while imagining he is in love with Charlotte. He is unable to properly analyse the psychological chemistry of his own feelings and what exactly happens in the Lawless family. This interferes with his struggle trying to interpret a letter that Newton wrote to Locke. The novella is a long letter he writes to his friend in which he tries to explain why he is unable to finish the book on Newton.

Sir

Being of opinion that you endeavoured to embroil me with woemen & by other means I was so much affected with it as that when one told me you were sickly & would not live I answered twere better if you were dead. I desire you to forgive me this uncharitableness. For I am now satisfied that what you have done is just & I beg your pardon for my having hard thoughts of you for it & for representing that you struck at the root of morality in a principle you laid down in your book of Ideas & designed to pursue in another book & that I took you for a Hobbist. I beg your pardon lso for saying or thinking that there was a designe to sell me an office, or to embroile me. I am

your most humble & most unfortunate Servant

Is. Newton.

This letter of Newton from September 1693 is historical, although Banville only tangentially refers to it. It starts with "Being of opinion that you endeavoured to embroil me with woemen..." and ends with "thinking that there was a designe to sell me an office, or to embroile me" and he apologizes for having been rude and angry about that. Newton obviously refused some offer by Locke upon which Locke told Newton that "he suffered from an incurable disease" and Newton answered "Drop dead". Newton explains his temporary loss of senses by writing that he "had not slept an hour a night for a fortnight together & for 5 nights together not a wink". Many biographers have speculated about what exactly had happened and why Newton had been so angry. Some have seen this rejection of women as an indication of Newton's homosexuality, but there is no evidence of that.

On the website corpusnewtonicum.wordpress.com/ we find a possible explanation under the title Why? You endeavoured to embroil me with woemen.... In 1693 Newton was 50 and had been in Cambridge for a long time. Most professors in his position would marry and look for a retirement position in London. This is probably what Locke had proposed to Newton. At that moment Newton probably just had a bad hair day and overreacted. In fact shortly after he accepted to become Warden of the Royal Mint in 1696. There was no marriage though. What Newton's relation with women was is still unresolved.

So Banville may have had problems understanding Newton's reaction and didn't know how to define Newton's feelings towards man or women, hence was unable to write his book about Newton, and ended up by writing a novella. So it can be interpreted as his explanation of why he could not finish the book on Newton that he probably wanted to write originally.   Adhemar Bultheel

8th European Congress of Mathematics
Organizing Committee
UP FAMNIT
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www.8ecm.si 8ecm2020@famnit.upr.si

Koper (Slovenia), 24th July 2018

Open calls for Minisymposia and Satellite conferences

Dear colleagues,

We would like to invite you to apply with proposals for **Minisimposia and Satellite Conferences** during the 8th European Congress of Mathematics (8ECM), to be held at Portorož, Slovenia, 5-11 July, 2020.

Internal and External Satellite Conferences (SC) will be held three days prior and after the official conference program. 8ECM Organizing Committee will offer full organizational and logistic support for organizers of Internal SC, so your focus would be entirely on the scientific programme.
For Minisyposia organizers, special incentives are offered.

We kindly invite you to review the open call at the official **8ECM website** and apply no later than the following deadlines:
Satellite Conferences - February 1st 2019
Minisymposia - December 1st 2019

We are looking forward to welcome you and your colleagues at the Congress and we remain available for further questions you may have at 8emc2020@famnit.upr.si.

Sincerely,

Professor Klavdija Kutnar
Dean of University of Primorska FAMNIT and
Deputy-chair of the 8ECM Organising Committee

Professor Tomaž Pisanski
Chair of the 8ECM Organising Committee

CYCLE DE CONFÉRENCES ALTAÏR

Programme 2018-2019

Le Centre d' Histoire des Sciences et des Techniques de l'ULB propose :

20 octobre 2018 : **Philippe CLAEYS** (VUB)
« Météorite s'en vient - Dino s'en vont »

10 novembre 2018 : **Jean BRICMONT** (UCLouvain)
"Mécanique quantique et politique pendant la guerre froide"

24 novembre 2018 : **Jean MAWHIN** (UCLouvain)
"Emmy fait de l'analyse: quand la symétrie conserve"

15 décembre 2018 : **Axel CLEEREMANS** (ULB-FNRS)
« La conscience dans tous ses états »

9 février 2019 : **Bertrand EYNARD** (Institut de Physique Théorique, Saclay et CRM, Montréal)
«Elles sont partout autour de nous, les matrices aléatoires»

23 février 2019 : **Denis SAVOIE** (Syrte, Observatoire de Paris)
"Une histoire des méridiennes du XVIè siècle à nos jours : instruments astronomiques et indicateurs du temps solaire"

23 mars 2019 : **Jean-Baptiste FRESSOZ** (CNRS)
"L'histoire des savoirs sur le changement climatique depuis le 16e siècle"

Horaire : le samedi matin de 10h à 12h

Localisation : ULB Campus Plaine, Forum Auditoire F, Boulevard du Triomphe

⚠️ Pour la conférence du 23/3/19 : Campus Plaine, Bât NO, 5ème étage, Salle Solvay

Tout public : 5 € par séance

Etudiants : entrée gratuite

Membres d'Altaïr (cotisation annuelle 12,50 €) : entrée gratuite

Renseignements : Alain JORISSEN (Alain.Jorissen@ulb.ac.be) et Luc LEMAIRE (llemaire@ulb.ac.be)