Newsletter

BELGIAN MATHEMATICAL SOCIETY

128, May 15, 2020

Comité National de Mathématique CNM

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NCW Nationaal Comité voor Wiskunde

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

Belgian Mathematical Society ASBL/VZW
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Contents

The next edition of this newsletter will appear on September 15th, so from now till September 7th all content can be sent to wendy.goemans@kuleuven.be. Any information that you qualify as interesting to be spread among the Belgian Maths community is very much welcomed! Examples of such information are: PhD defenses, seminars, conferences, workshops, meetings, interaction with other sciences or business companies, popular lectures, school initiatives, math exhibitions, job opportunities, . . .

Foreword

Dear BMS members,

We hope that you are all adjusting to these strange times and that you and your loved ones have remained out of harm's way.

First of all it is with a heavy heart that we mourn John Conway who passed away in April from complications caused by Covid-19. This prolific mathematician proposed many fundamental contributions in a wide variety of fields. He will be fondly remembered by many. A short obituary is provided below.

I wish to extend a warm thought to all those who are teaching or studying through the pandemic and global shutdown. The general public likely does not understand how the sudden shift to online teaching and administration has dramatically overwhelmed all those who are involved in academia. It is my belief that students should be admired for agreeing to partake in this bull ride without complaining, and teachers should be lauded for agreeing to do their best to ensure that no one gets (too badly) hurt in the process. All around I see students who are doubling their efforts to gain autonomy and keep learning as best they can, teachers not counting their hours to adapt their methods and teach as best they can, and administrative staff working tirelessly to make all this possible. I hope that this collaborative spirit diffuses throughout our Society and perdures during the pandemic to makes us all stronger and more able to tackle the new world that is awaiting us on the other side.

In other news there is not much news. The BMS has become slightly dormant with the sudden overload of all those involved in its administration. Rest assured that it will wake up again very soon. Don't forget next year is 2021, which means our society turns 100. This will be something to celebrate and look forward to.

Please take care and don't hesitate to interact, if there is anything the BMS can do it will be glad to deliver!

Yours sincerely,
Philippe, Wendy and Yvik

In memoriam John Horton Conway

John Horton Conway was born in Liverpool on 26 december 1937 and died at the age of 82 on april 11, 2020 as a consequence of Covid-19 complications. He was an emeritus professor form Princeton and got several prestigious mathematical prizes. Averse of all convention, he loved to play the game of mathematics as no other. He became known to non-mathematicians when he invented *The Game of Life*, a cellular automaton that simulated population dynamics, and in fact life itself, using only a set of simple rules. But his mathematical work was prolific and very diverse since he enjoyed doing whatever came along that could catch his attention. John H. Conway was one of the keynote speakers at the very first conference that the BMS organised jointly with another math society: The joint BeNeLux-AMS Conference in 1996. *A genius at play* is a biography written by S. Roberts in 2015. A review can be found in This Newsletter in the January issue of 2017.

Adhemar Bultheel and Philippe Cara

May 12th and the legacy of Maryam Mirzakhani

Since 2019, the date of May 12th, birthday of Maryam Mirzakhani, has been chosen to celebrate Women in Mathematics. On this occasion, the May 12th initiative organized an online screening of the movie "Secrets of the Surface, the mathematical vision of Maryam Mirzakhani", by George Csicsery, a documentary devoted to the life and work of Maryam. More information is available here : https://may12.womeninmaths.org/why.

EGMO 2020 and BxMO 2020 results: Congratulations to all participants!!

Due to the covid-19 measurements, this years' editions of the European Girls' Mathematical Olympiad (EGMO) and the Benelux Mathematical Olympiad (BxMO) took place online. Nonetheless, the participants tackled the challenging problems with verve, obtained good scores and above all, enjoyed themselves! All results and the problems can be found on https://www.egmo.org/egmos/egmo9/ and http://www.bxmo.org/results/2020.

1 News from the BMS & NCM

1.1 Bulletin of the Belgian Mathematical Society - Simon Stevin

For the table of contents of previous issues, see https://projecteuclid.org/all/euclid.bbms.

Remember, as a member of the BMS you can ask for electronic access to all electronically available issues of the bulletin, if you don't have a login yet, contact pcara@vub.ac.be.

2 (Online) Meetings, Conferences, Lectures, . . .

Modèles mathématiques et confinement

Michel Rigo

About raising public awareness of mathematics, a text and a YouTube video (in French) "Modèles mathématiques et confinement" aimed at high school students and math. teachers is available on-line:

https://orbi.uliege.be/handle/2268/246583 and https://youtu.be/wJ-K8W321pA

2.1 May 2020

Proclamatie en prijsuitreiking 19de JVWO & 35ste VWO
May 20, 2020

See the invitation at the end of this newsletter and follow the event at either

https://www.facebook.com/vlaamsewiskundeolympiade or https://www.vwo.be/

2.2 Postponed activities

Second Antipode Workshop

ULB

Due to the uncertainty caused by Covid-19, the "Second Antipode Workshop" announced in the previous BMS-NCM Newsletter is postponed to 2021. The exact dates will be announced later. For updates and more information, we refer to the website: http://homepages.vub.ac.be/ hopfalgb/ANTIPODE2/

3 PhD theses

Exceptional orthogonal polynomials and Wronskians

Niels Bonneux
KU Leuven
May 28, 2020, 17h00

Thesis advisor: Prof. dr. Arno Kuijlaars (KU Leuven)

Summary

My thesis explores Wronskian polynomials which appear in the field of exceptional orthogonal polynomials and also play a key role in the rational solutions of Painlevé equations. Both research fields are rapidly gaining interest and their connections to Wronskian polynomials are increasingly studied. The goal of my research is to explain these connections and describe their valuable features.

Exceptional orthogonal polynomials were introduced in 2009 as an extension of the classic orthogonal polynomials. Their characteristic feature is that the sequence of polynomials has finitely many gaps in their degree sequence, meaning that there is no polynomial for a finite number of degrees. The thesis covers a systematic construction of exceptional orthogonal polynomials labeled by partitions, as well as numerous results that are expressed via these partitions. The exceptional Laguerre polynomials and the exceptional Jacobi polynomials in particular are analyzed in detail, and the asymptotic properties of their zeros are derived. Exceptional Hermite polynomials are covered as well, these polynomials are described within the class of Wronskian Hermite polynomials for which different recurrence relations are determined. These results are then translated into recurrence relations for Wronskian Laguerre polynomials, and generalized to results for Wronskian Appell polynomials. This generalization is established via a connection with symmetric function theory, which emphasizes that the use of partitions not only makes the labeling elegant, but also that combinatorial results translate into remarkable properties for these polynomials. For example, it is shown that Wronskian Hermite polynomials have integer coefficients via this connection. Next, these coefficients are examined in more detail where the combinatorial concepts of cores and quotients are crucial. The fact that these coefficients can be traced by means of the characters of the irreducible representations of the symmetric group shows once again that the combinatorial framework gives many intriguing results.

See also

https://agenda.kuleuven.be/nl/content/doctoraatsverdediging-niels-bonneux#

The local universality of Muttalib-Borodin ensembles

Leslie Molag
KU Leuven
May 29, 2020, 16h00

Thesis advisor: Prof. dr. Arno Kuijlaars (KU Leuven)

Summary

The Muttalib-Borodin ensemble, with parameter $\theta > 0$, is described by the joint probability density function

$$\frac{1}{Z_n} \prod_{1 \le i < j \le n} (x_i - x_j)(x_i^\theta - x_j^\theta) \prod_{j=1}^{n} w(x_j), \qquad x_1, \dots, x_n > 0,$$

where Z_n is a normalization constant and w is some weight function. It has applications in random matrix theory, and, in particular, describes the eigenvalue distribution for certain random matrix models. "Universality" is an important and beautiful concept in random matrix theory. It is the phenomenon that certain limits, viewed in an adequately rescaled regime, do not depend on the global specifics of the particular random matrix model. Intuitively, one could compare such behavior to the central limit theorem. The Muttalib-Borodin ensemble can alternatively be characterized by a so-called correlation kernel. In the thesis, we prove that this correlation kernel, when properly rescaled by powers of n, approaches a limiting correlation kernel as $n \to \infty$, for a large class of weights w, thus showing universality.

The defence can be followed online, all information is available at

https://agenda.kuleuven.be/nl/content/doctoraatsverdediging-leslie-di-go-molag#

Dynamics on multi-player games played on graphs

Marion Hallet
Université de Mons
June 19, 2020

Thesis advisors: Prof. dr. Thomas Brihaye (directeur) (Université de Mons) et Prof. dr. Gilles Geeraerts (co-directeur) (Université Libre de Bruxelles)

Summary

Since the seminal works of Morgenstern and von Neuman in the forties, game theory has emerged as a prominent paradigm to model the behaviour of rational and selfish agents acting in a competitive setting. In particular, it has been applied to computer sciences. In this context, several agents (called players) usually model different components of a computer system (and of its environment). They are assumed to be rational, and interact in order to reach a fixed objective.

In this thesis, we are concerned with multi-player games played on graphs. They are games in which $n \geq 2$ players interact trying to fulfill their own objectives (which are not necessarily antagonistic to the others'); and where the arena (defining the possible actions of the players) is given as a finite graph. Every node of the graph is owned by a player. The game is played by letting players move a token along the edges of the arena.

The point of this thesis is to study the notion of dynamics in games which model the behaviour of the players when they repeatedly update their strategy (i.e. their choices of actions) in order to achieve a better outcome. The idea behind the notion of dynamics is the following: the game is played once with a strategy profile for the players. One (or several) player is not satisfied with his strategy (because he could have chose a better strategy, due to the choice of the other players). Then the game is played a second time, with the new strategy profile. Maybe another player will be unsatisfied with his strategy and the game will be played once again. A dynamics terminates when these updates converge to an equilibrium, i.e. a state in which the players have no incentive to further update their respective strategies.

We define several properties that a dynamics has to satisfy or not. For example, we can require that a dynamics satisfy the *one player property*, which means that each update has to be performed by a unique player at a time. Another possible requirement the *lazy property*, which means that the players updating their strategy perform it with the minimal number of changes.

There are two kinds of contributions in the thesis. The first one is to draw a general framework to reason about the termination of dynamics in order to show its applicability to particular problems. It relies on notions of preorders, in particular the simulation preorder. Simulations are usually defined on transition systems: intuitively, a system A simulates a system B if each step of B can be mimicked in A. We consider two kinds of preorders: preorders defined on game graphs, i.e. on the structure of the games; and simulations defined on the dynamics, which are useful to reason about termination (indeed, if a dynamics $\rightarrow$ simulates a dynamics $\rightarrow'$, and if $\rightarrow$ terminates, then $\rightarrow'$ terminates as well). We show how the existence of a relation between game graphs implies the existence of a simulation between the induced dynamics of those games. This technique allows us to check the termination of the dynamics using structural criteria about the game graph.

The second kind of contribution is the application to a particular context, characterised by three parameters: the arena of the game, the conditions over the dynamics, and the payoff functions of the players.

The first arena we deal with are sequential games (or games played on trees). Among other results, we prove that the acyclicity of the preferences is a necessary and sufficient condition to ensure the termination of dynamics that respect the *Subgame Improvement Property* (i.e. every update has to improve the payoff in the subgame of the change). We also consider the so called Coalitional Dynamics (in which several players can make coalitions in order to update their strategies) and discover a pattern over the preferences of the players that has to be avoided.

The second arena is the so called One-player Games. We model BGP (Border Gateway Protocol, which is a standard interdomain routing protocol) into dynamics on graphs. We firstly revisit some classical results of network theory in our context, then we identify a theoretical and relevant framework regarding to the termination of the dynamics.

We also make the first step in a broader context, considering some games played on graph, such as reachability games and mean-payoff games. We only obtained some results of termination.

4 Job announcements

4.1 From KU Leuven

4.1.1 Junior Professor in Zuivere wiskunde (campus Kulak, Kortrijk)

Aan de Groep Wetenschap en Technologie, Faculteit Wetenschappen, Departement Wiskunde van KU Leuven is er een voltijdse vacature in het zelfstandig academisch personeel in het domein van de Zuivere Wiskunde op Campus Kulak in Kortrijk. Op Campus Kulak worden Bachelors in de Wetenschappen onderwezen, met doorstroomopties naar de farmaceutische wetenschappen, de ingenieurs- en de bio-ingenieurswetenschappen. Het is dan ook een erg multidisciplinaire omgeving, zowel voor wat betreft onderwijs als onderzoek. Het wiskundig onderzoek op de campus situeert zich in de onderzoeksgroepen Algebraïsche Topologie en Groepentheorie (zuivere wiskunde) en Wiskundige Natuurkunde (modellering en simulatie van fysische golffenomenen & signaalanalyse) van het Departement Wiskunde.

Meer informatie op https://www.kuleuven.be/personeel/jobsite/jobs/55577262.

Solliciteren tot 30 september 2020.

4.2 From ULB

4.2.1 Deux postes d'assistant.e temps plein en mathématique

See all information at the end of this newsletter or at http://wwwdev.ulb.ac.be/greffe/files/6805.pdf.

Note that candidates are required to contact a supervisor before applying.

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

5.1 Adhemar's corner

To help you get through the summer, here follow some good reading tips, offered by Adhemar Bultheel. *The Prime Number Conspiracy* is on a collection of papers from Quanta Magazine discussing mathematical topics. The second review is on the history of the Fields Medal and the biography of J.C. Fields one finds in *Turbulent times in mathematics*.

Enjoy reading!

Uitnodiging

Proclamatie en prijsuitreiking 2019-2020
19de Junior Wiskunde Olympiade & 35ste Vlaamse Wiskunde Olympiade

Programma

Verwelkoming
prof. dr. Stefaan Vaes

De Kangoeroewedstrijd

Wiskundige epidemiologie in tijden van het nieuwe coronavirus
prof. dr. Niel Hens

Bekendmaking Prijzen Vlaamse Wiskunde Olympiade en IMO selectie

Wiskundige epidemiologie in tijden van het nieuwe coronavirus

prof. dr. Niel Hens

Niel Hens is hoogleraar biostatistiek en vaccinologie aan de Universiteit Hasselt en de Universiteit Antwerpen. Hij ontwikkelt wiskundige methoden om de verspreiding van infectieziekten in kaart te brengen. Hij is lid van de GEES-expertengroep die de Belgische exitstrategie uit de coronacrisis uittekent.

Een online weblezing
Woensdag 20 mei 2020 om 15.00 uur,
te volgen op naar keuze
www.facebook.com/vlaamsewiskundeolympiade
www.vwo.be

Vlaamse overheid

STEM
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The Prime Number Conspiracy by *Thomas Lin* (ed.). MIT Press, 2018 (336 p.) isbn: 978-0-26253-635-6.

Thomas Lin

Thomas Lin is since 2012 the founder and editor in chief of the highly regarded online *Quanta Magazine*, a non profit publication with the purpose of promoting science. It is funded by *The Simons Foundation*, an organization created by James Simons, a billionaire mathematician and hedge-fund founder. The idea is that the articles cover topics from hard science in about five to ten pages. They should be intellectually rigorous, yet engaging stories that are somewhat outside the mainstream media.

With this book, Lin has selected 37 of these stories related to mathematics in general. The title of the books is the same as the title of the fourth contribution, which, just like the first three, is discussing prime numbers, but the other ones are not. So the book title may be a bit misleading as if promising a book completely devoted to prime numbers. The texts are written in a magazine style, which is sometimes the reflection of an interview of for example a scientist who just published a ground breaking result in his discipline, or one that won a prize. It can also be that it is just an accessible description of an important result. For example in the prime number part we find two reports about how the gap between successive twin primes was made smaller. Another one is about the number of prime factors of an integer being even or odd. It is using a technique that helped to develop new results related to the prime number theorem. The one that delivered the title of the book is about the fact that the rightmost digit of a prime number is equally distributed over 1,3,4,6,7,8,9 (for an odd prime it cannot be 2 or 5).

There are six other parts. I cannot enumerate here all 37 subjects, so I just give an idea of what the parts are about and somewhat randomly pick some topics as an illustration. The second part is called "Is math the universal language of nature?" The first report is on Monstrous Moonshine theory (linking the monster group and string theory) and another is about a universality phenomenon in the spectra of random matrices, and more generally how order is hidden in all kinds of random phenomena in nature.

Part 3 is about important proofs that were discovered "by accident". The proof of the Gaussian correlation inequality (GCI), solution of the Kadison-Singer problem, pentagonal tessellation of the plane or sphere packing in higher dimensions are examples of results found by serendipity, e.g. by someone unknown to the community, or by using a technique from a related field that is unusual in the domain.

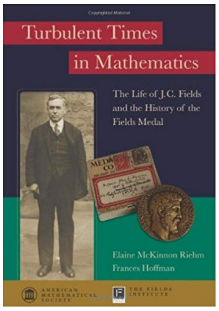
The reports in part 4 shed some light on how the best mathematical minds are functioning. Maryam Mirzakhani, Artur Avila, and Manjul Bhargava, all winners of the Fields Medal in 2014, Peter Scholtze was winner in 2018, Yitang Zhang is the one who featured in the first report of this book. He found an upper bound for the gap between k-tuples of primes (the twins have $k = 2$). Among the "older" minds interviewed are Freeman Dyson, without a PhD, but prominent member of the IAS in Princeton, and Michael Atiyah former president of both the London and the Edinburgh Royal Society.

The next part is about computers and mathematics. Secutity problems in software code, the design of a formal motovic cohomology system, bringing the graph isomorfism problem closer to the class P than to NP and other reports on complexity theory. Part 7 is about infinity: the continuum hypothesis, and recent results in complexity, Ramsey and model theory. The last part is about mathematicians that were inspired by their mathematical heros or that have been inspiring for others: Ken Otto admires Ramanujan, Francis Su is former president of the MAA, Rebecca Goldin is director of the Statistical Assessment Service and motor behind STATS, a non profit organization to promote statistical literacy among journalists.

The book is similar to Devlin's collections "The Best Writings on Mathematics" (there is in fact some overlap), or "What's Happening in the Mathematical Sciences" from the AMS. Not for the utter layman, but generally accessible for any mathematician. All the contributions are from the first five years of the existence of Quanta. They are however slightly edited to make them up-to-date. Almost simultaneously appeared a volume with a collection of papers about physics called *Alice and Bob meet the wall of fire*.

Adhemar Bultheel

Turbulent Times in Mathematics: The Life of J.C. Fields and the History of the Fields Medal, Elaine McKinnon Riehm and Frances Hoffman, AMS, 2011 (258 p.) isbn: 978-0821869147.



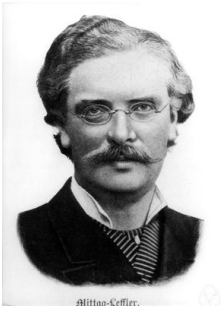
John Charles Fields

That there is no Nobel Prize for mathematics and that the Fields Medal is considered to be a mathematical Nobel Prize is known by every mathematician. But who was Fields? Not so many will be able to tell you. There is not a famous theory or theorem named after him. When Norway proposed the Abel Prize to complete the Nobel Prize, it was obvious that it was named after the famous mathematician Niels Hendrik Abel (1802-1829) who died very young of tuberculosis. A first proposal for that prize was made during a centennial conference in 1902 in his honour but the first one officially awarded was to Jean-Pierre Serre in 2003 (about 750K€) and is given annually ever since.

The Fields Medal (about 10K€) is awarded during the International Mathematics Congress (IMC) of the International Mathematical Union (IMU) held every 4 years to 2 (later up to 4) young mathematicians (under 40). Together with the Abel Prize, it is still considered to be one of the highest possible recognitions in mathematics. It was first awarded in 1936 during the IMC in Oslo, but because of WWII, and because the IMU had to reinvent itself, the next ones were only given in 1950, but they are awarded regularly since then.

You can of course look up the necessary key-words on Wikipedia, but all the juicy details of how it came about and who John Charles Fields (1863-1932) was can be found described in all detail in this book.

Fields' father was a tanner who arrived in Harrington (Canada) when the town was just outgrowing a Wild-West pioneering status. J.C. had an older sister and a younger brother that survived childhood. He was an excellent student in mathematics. His father died when he was 11 and his mother at his 18. He could however continue his studies at the nearby University of Toronto. Got a PhD in 1987 and did some postdoc years in the US and came to Europe in 1892-1900 (Paris, Göttingen, Berlin which were considered the main knowledge centres for mathematics). He was especially pleased by the German way of teaching mathematics in seminar style, much more than the French approach. He returned to the US and was appointed at the University of Toronto, where he wanted to promote the research in mathematics. In those days, there was not a tradition of mathematical research, it just was growing out on infancy.



G. Mittag-Leffler

the Djursholm villa

He did publish papers and he wrote a book (*Theory of Algebraic Functions of a Complex Variable*, 1906) but his mathematical research work is not of a ground breaking quality. His urge to promote research has been a driving force and his admiration for the Europeans made him travel to Europe almost every summer when he was not teaching (he learned French and German). During these travels, he expanded his network and made many friends everywhere around the globe. The Swedish mathematician Gösta Mittag-Leffler (1846-1927), had created another attraction pole in his villa in the Stockholm suburb of Djursholm. It was flooded by visitors from all over the world and the journal *Acta Mathematica* that he founded was and still is highly respected. He was the one to organize the Abel centennial conference in 1902 where he had invited Fields. The popularity of Mittag-Leffler, also with women as a defender of women's rights was in stark contrast with the personality of Alfred Nobel who was a celibatarian. So there

is no Nobel Prize for mathematics to prevent that Mittag-Leffler would get it.

When the war started in 1914, Belgium was quickly conquered and the news of Leuven being burned was spreading the world. The subsequent scientific schism was partly caused by a manifesto signed by 93 prominent Germans among which 13 scientists that wanted to defend what had happened in Belgium claiming it was all false news and that it was all self-defence of the German troops. Klein and Planck where among the ones that signed, Hilbert and Carathéodory refused. Thereafter the French expelled all Germans form their Académie.

Leuven 1914

An international group of scientists met in London and Paris in 1918 and founded the International Research Council (IRC) with the French mathematician Émil Picard as president. Picard had lost a son during the war and strongly insisted on the rule that Germany and its allies would be excluded from all future participation. The inaugural meeting was held in Brussels in 1919 presided by King Albert I and had 224 delegates. G.H. Hardy and Mittag-Leffler tried to mollify the banning of the Germans, but it was nevertheless retained. A next IMC was organized in Strasbourg in 1920 without the Germans, who claimed that it was therefore not "International" any more. There it was decided to organize science in unions. For mathematics this was the International Mathematical Union (IMU) that had been organizing the previous IMCs (e.g. in Paris (1900), where Hilbert proposed his millennium problems). The Belgian Charles de la Valleé-Poussin became its president in 1919, and it was proposed that the next meeting in 1924 would take place in the US.


E. Picard


C. de la Vallée-Poussin

However the controversy about whether or not to exclude Germans continued and divided the AMS. If the Germans were invited, then the French refused to come, while it was unthinkable to organize a conference without calling onto the most important scientists of that time like Hilbert, Planck, Einstein, Weyl,... This is where Fields saw an opportunity to bring science to Canada and boost Canadian research and he proposed to organize it in Toronto. The Americans were glad to have the hot potato out of their hands and agreed. Fields may have underestimated the logistic and financial consequences but was confident that he would manage. Another conference (of the British Association for the Advancement of Science (BAAS)) was already planned and the IMU would follow it the week after. Fields was an admirer of Germans science and was in favour of German participation, but since the IMU was associated with the IRC, he had to comply with the exclusion of the Germans.

Fields started a crusade to raise funding. He traveled to Europe once more to personally invite people and organized his nerve center in Paris and London to make communication easier. He organized the boat trips, the lodging, and the sponsoring because many of the European countries were short of money for scientific meetings shortly after the war. He traveled by boat together with several participants back to Canada to arrive just in time for the opening.

The conference was a big success. From Belgium participated de la Vallée-Poussin (Academy, Leuven), Godeaux (National Committee, Brussels), Dumoulin (BMS, Gent), Merlin and Servais (Gent). After the conference Fields organized a long train trip across Canada as a tourist excursion for some participants which he accompanied to help with practical things and serve as a translator. Twenty more sleepless nights was the drop that makes the bucket overflow, and Fields collapsed

with angina pectoris. He had to stay in bed for several weeks, but he was barely recovered when he started to collect and edit the proceedings, together with the Program Committee. It eventually resulted in two volumes of over 800 pages that were published in 1928.

S. Pincherle

Salvatore Pincherle from Italy gave one of the invited lectures at the 1924 Congress and proposed to have the next 1928 IMC in his home town Bologna. The unabated dispute about the exclusion of the Germans continued. After signing post-war treaties, the membership restrictions of the IRC was removed on a general meeting in Brussels in 1926. Pincherle, like many others were trying to heal the wounds and to reconcile French and German mathematicians, but now the Germans refused because the IMU was associated with the IRC that had discriminated them for so long. Pincherle solved the dilemma by organizing the conference in the name of the University of Bologna, so that Germans could attend. Among them was Hilbert who said "For mathematics, the whole cultural world is a single country".

So Germany had not become a member of the IMU. Germany considered it as a political (rather than scientific) organization. In 1929 and subsequent years Fields, notwithstanding his poor health, traveled to Europe to visit people trying to reconcile them with quite diplomacy in bilateral negotiations. At the next IMC in Zürich (1932) the IMU ceased to exist and eventually dissolved itself on the next meeting in Oslo (1936). It was only re-established as a new organization in 1951 after WWII.

Fields started thinking about establishing a medal for young mathematicians during these European travels and started once more hunting for financial support. After selling 700 copies of the proceedings of the Toronto ICM, a surplus was noted and $2500 were put aside to be awarded to two medals during a forthcoming ICM. Fields insisted that the medal should have no reference to persons, countries or languages. He never explicitly required that the winners should be under 40, but his objective of promoting emerging research points in that direction. He also had tried to promote applied mathematics, so there is room to also look beyond the pure mathematicians. The first medals ware awarded in Oslo (1936) to Lars Ahlfors (Helsinki) and Jesse Douglas (MIT).

He however did not live to this moment. He died in 1932 from a cerebral hemorrhage. His friend John Lighton Synge (an Irish mathematician and physicist who was at that time in Toronto) took over from Fields to set up the design of the medal itself and the organization of the committee for the Fields Medal. The plaque was designed by the Canadian sculptor Richard Tait McKenzie and shows a bas relief of the head of Archimedes and the Latin text reads "Transire suum pectus mundoque potiri" ("Rise above oneself and grasp the world") and the name of Archmedes in Greek ΑΡΧΙΜΗΔΟΥΣ. (The date 1933 MCNXIII has a spelling error and should be MCMXXXIII). The back side reads "Congregati ex toto orbre matematici ob scripta insignia tribuere" ("Awarded by mathematicians gathered from the entire world for outstanding writings"). The name of the prize winner is written on the rim.

So far two Belgians have won the Fields Medal: Pierre Deligne (1978) and Jean Bourgain (1994). Andrew Wiles was just over 40 when his first version of his proof of Fermat's last theorem in 1993 became available. However a gap needed fixing, so he got the Silver Medal in 1998. Grigori Perelman won the medal in 2006 for his proof of the Poincaré conjecture, but by that time he was fed up with the mathematical community and refused. Maryam Mirzakhani was the first woman to get the medal in 2014.

Adhemar Bultheel

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HR EXCELLENCE IN RESEARCH

DEUX POSTES D'ASSISTANT·E TEMPS PLEIN EN MATHÉMATIQUE

FACULTE DES SCIENCES

Référence : 2020/S102
Date limite du dépôt des candidatures : 17/06/2020
Date d'entrée en fonction prévue le : 01/10/2020

Descriptif du poste

Les activités d'un.e assistant.e se répartissent entre la recherche, l'enseignement et les services à la collectivité.
Les activités de recherche sont principalement consacrées à la réalisation d'une thèse de doctorat dans un des domaines de recherche du Département de Mathématique. La/e candidat.e doit avoir pris un contact préalable dans ce sens avec l'un des Professeurs du Département.
Les activités consacrées à l'enseignement concernent l'encadrement de séances d'exercices pour des cours divers dans le domaine des mathématiques (maximum 300 h/an) et d'autres tâches pédagogiques telles l'élaboration, la surveillance et la correction d'examens …
Occasionnellement l'assistant.e participe à des activités de service à la collectivité (par ex. Participation aux instances participatives, aux salons étudiants, etc.).
Un mandat d'assistant.e est octroyé pour un premier terme de 2 ans, renouvelable après avis des organes compétents pour 2 autres périodes de 2 ans maximum.

Titre requis

Titulaire d'une Licence en Sciences mathématiques ou d'un Master 120 crédits en Sciences mathématiques, en Statistique, en Sciences Actuarielles, ou titre reconnu équivalent et satisfaire aux conditions d'accès au doctorat.

Compétences requises

- Haut niveau scientifique en mathématiques.
- Excellentes qualités pédagogiques.
- Bonne capacité d'intégration au sein de l'équipe d'enseignants.

Enseignements à encadrer

Exercices et travaux personnels, y compris l'élaboration, la surveillance et la correction d'examens (et autres travaux), de mathématique de 1er et 2ème cycle.

Intéressé·e ?

Des renseignements complémentaires peuvent être obtenus auprès de M. Joel Fine, président de la Commission Assistants du Département de Mathématiques (courriel : jfine@ulb.ac.be) et auprès de M. Michele D'Adderio, président de la Commission de Coordination Pédagogique du

Département de Mathématique (courriel : mdadderi@ulb.ac.be).

Le dossier de candidature doit être transmis sous format électronique, via l'envoi d'un mail unique adressé au Rectorat de l'Université libre de Bruxelles (à l'adresse recteur@ulb. be) et au Décanat de la Faculté à l'adresse suivante : Aff.acad.sciences@ulb.be

Il contiendra les pièces suivantes :

- une lettre de motivation
- un Curriculum vitae, comprenant une liste des publications :
  un formulaire type peut être complété via le site internet : https://www.ulb.be/fr/documents-officiels/completer-votre-cv-en-ligne. Une fois complété, celui-ci doit être téléchargé et joint au dossier de candidature.
- une description du projet de thèse (4 pages maximum)
- deux lettres de référence

En postulant, les candidat·e·s confirment avoir pris connaissance des informations complémentaires et des règlements applicables aux membres du corps scientifique disponibles sur notre site à l'adresse http://www.ulb.ac.be/emploi/academique.html.