BELGIAN MATHEMATICAL SOCIETY

BMS-NCM NEWS

—

No 76, January 15, 2010

Letter from the editor

*Welcome to our **"January 15, 2010-Newsletter"***
Happy New Year!!! to all of you

Françoise

Contents

1 News from the BMS

• The next

$$\boxed{\textbf{PhD-day of the BMS}}$$

will take place in Brussels (Academy) on

Monday September 13, 2010.

More informations will be available in the forthcoming Newsletters! Please, have also a look at the web pages of the BMS (http://bms.ulb.ac.be/cgi/announce.php) or contact one of the member of the organizing committee (Françoise Bastin, F.Bastin@ulg.ac.be; Adhemar Bultheel, adhemar.bultheel@cs.kuleuven.be; Stefaan Caenepeel, scaenepe@vub.ac.be; Philippe Cara, pcara@vub.ac.be; Paul Godin, pgodin@ulb.ac.be; Stefaan Vaes, Stefaan.Vaes@wis.kuleuven.be)

• Please find all the information (leaflet) at the end of this Newsletter for

$$\boxed{\textbf{the renewal of you membership to our society!}}$$

A bank document should also be available in the envelop (as usual in January, you are to receive also a paper copy of this Newsletter).

Many thanks for your support

2   Meetings, Conferences, Lectures

2.1   January 2010

Workshop Hopf-Galois Theory

Vrije Universiteit Brussel, January 22, 2010

10.00-10.50	J. Cuadra (Universidad de Almería)
	A Hopf algebra admitting a separable Galois extension is finite dimensional
10.50-11.20	**Coffee**
11.20-12.10	D. Bulacu (University of Bucharest and Vrije Universiteit Brussel)
	Two classes of weak braided Hopf algebras
12.10-14.30	**Lunch**
14.30-15.20	Jiwei He (University of Antwerp)
	Dualities and Calabi-Yau property of coalgebras
15.20-15.50	**Coffee**
15.50-16.40	Haixing Zhu (Universiteit Hasselt)
	Bicovariant differential calculus on quantum groupoids

Place: Vrije Universiteit Brussel, Campus Oefenplein, Building G, Room 6G324.

Everybody is cordially invited!

Lunch will be offered to participants who register by email to **scaenepe@vub.ac.be** before January 21.

For more information on the Seminar on Hopf Galois Theory, see

http://wis.kuleuven.be/analyse/seminar-hopf-galois.html.

S. Caenepeel

Lille-Delft Analysis Workshop 3
Lille, 21-22 janvier 2010

For more information, see http://math.univ-lille1.fr/congres/

2.2   February-March 2010

International Francqui Chair 2009-2010
Professor Ingrid Daubechies (Princeton University)

Inaugural lecture: Monday February 1, 2010 at 16h (Auditorium QD, Vrije Universiteit Brussel, Pleinlaan 2, 1050 Brussel)

Discrete differential geometry and measuring similarity between surfaces

Two-dimensional surfaces play an important role in a wide range of fields, from Toy Story to complex material interfaces and your brain cortex. To recognize and classify objects, or to detect changes, it is useful to quantify how similar two surfaces are, i.e. to define a "similarity metric" on the set of two-dimensional surfaces in three-dimensional space that makes mathematical sense and is easy to compute. This talk will illustrate work by Yaron Lipman and the speaker that uses discrete differential geometry (no—it is not an oxymoron!) to tackle this question, and will showcase an application to lemur dentistry.

Other lectures:

• Mathematics meets Fine Arts: analyzing paintings with image processing tools
March 1st 2010, 16h00.
Universiteit Gent, Jozef Plateauzaal, Jozef Plateaustraat 22, 9000 Gent

• Independent component analysis and functional Magnetic Resonance Imaging
March 15th, 2010 (time to be announced).
UCLouvain, Auditoire Science 02.

•ULB: To be announced ...

More information: http://www.sparsity.be/chair.html

2.3   April 2010

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Interdisciplinary workshop on
"Sparsity and Modern Mathematical Methods for High Dimensional Data"
April 6-10, 2010, Vrije Universiteit Brussel, Brussels, Belgium

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Conference website: http://www.sparsity.be

Topics:
-sparse techniques in inverse problems and compressed sensing (theory, algorithms, applications, ...)
-wavelet-like transforms (shearlets, curvelets, use of non-regular grids, ...)
-statistical multi-resolution modeling and restoration of images (with applications in remote sensing, biomedical imaging, ...)
-analysis of multi-spectral data and the study of art

This workshop will give young scientists in particular the opportunity to present their recent results on new mathematical methods for high-dimensional data and their applications, to a broad audience. In addition, a small number of invited speakers will present their research field in a more general way.

Background:
In recent years exciting new developments in mathematics and computer science have opened up new domains of application for computational mathematics. These developments bring new challenges, for which new approaches and new tools must be developed. These draw not only from traditional linear-algebra-based numerical analysis or approximation theory, but also from information theory, graph theory, the geometry of Banach spaces, probability theory, and more. Often the features, patterns or structures of interest hidden in the data, are typically concentrated on subspaces or manifolds of much smaller dimensions. Even if one has no extra a priori knowledge about which subspace or submanifold might carry the information of interest, the knowledge that it is of much smaller dimension helps in "digging it out". Taking advantage of this underlying sparsity lies at the heart of these new developments. It is also the central tenet of compressed sensing and is presently seeing intense development in inverse problems as well.

The workshop is part of the activities organized on the occasion of the appointment of Prof. Daubechies as International Francqui Professor at the VUB (January-June 2010).

Guest speakers:
Ingrid Daubechies (Princeton University)
Gitta Kutyniok (Universität Osnabrück, Osnabrück)
Javier Portilla (Instituto de Optica, CSIC, Madrid)
David Stork (Ricoh Innovations, Menlo Park)
Pierre Vandergheynst (EPFL, Lausanne)
Dimitri Van De Ville (EPFL, Lausanne)

Organizers:
Ingrid Daubechies (Princeton University), Christine De Mol (ULB, Brussels), Ignace Loris (VUB, Brussels), Benoit Macq (UCL, Louvain) Aleksandra Pizurica (UGent, Gent), Philippe Cara (VUB, Brussels) Ann Dooms (VUB, Brussels), Caroline Verhoeven (VUB, Brussels)

Information:
Conference website and registration: http://www.sparsity.be
Email: info@sparsity.be

<div align="center">

Wavelets and Fractals
26-28 April, 2010
Esneux (Liège) , Domaine du Rond-Chêne

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This workshop is organized in collaboration with the "Fractal team" of Paris-12 Créteil. More information will be available in the forthcoming Newsletters. **Prof. I. Daubechies (International Francqui chair)** has already accepted to deliver a talk on this occasion.

For any information, please contact Samuel Nicolay (S.Nicolay@ulg.ac.be) or Christine De Mol (demol@ulb.ac.be) or Françoise Bastin (F.Bastin@ulg.ac.be)

3   PhD theses

UNIVERSITY OF LIÈGE

<u>Title</u>: Recognizability of sets of polynomials with coefficients in a finite field <u>Name</u>: Laurent Waxweiler
<u>Supervisor</u>: Michel Rigo
<u>Date</u>: December 11, 2009, ULg

Recognizability of sets of polynomials with coefficients in a finite field
Laurent Waxweiler, December 11, 2009, University of Liège

Syntactical properties of representations of integers in various number systems are well-known and have been extensively studied. The P-recognizable sets of polynomials over finite field have been transposed. In this thesis, we transpose the notion of P-definable set of integers into the framework of the polynomial ring over a finite field $\mathbb{F}$. We define P-definable sets of tuples of polynomials over $\mathbb{F}$ and show that a set of tuples of polynomials over $\mathbb{F}$ is P-recognizable if and only if it is P-definable. We define also (P,Q)-definable sets and we proof that if P and Q are multiplicatively independent then the set $\{(A,B,C) : AB = C\}$ of tuples of polynomials over $\mathbb{F}$ is (P,Q)-definable.

4   Miscellaneous

4.1   From University of Antwerp

Call for a Professor in Statistics, UA

At the Department of Mathematics and Computer Science (UA) there is an opening, as of October 1 2010, for a Professor in Statistics. The **deadline for application is: February 15, 2010.**

The complete message (in Dutch) can be read on the web page:

http://www.ua.ac.be/main.aspx?c=*VACATURES&n=26936&ct=026198&e=216900

Information about completing the application form can be obtained from Ellen Huijer (ellen.huijer@ua.ac.be, tel. +32 3 265 31 49). And information about the contents of the position can be obtained from Prof. Karel in't Hout, karel.inthout@ua.ac.be – tel. +32 3 265 38 97

4.2   From France

Postes à Lille

Deux postes de professeur en 25ieme section sont susceptibles d'être mis au concours à l'Université Lille 1/Laboratoire Paul Painleve en 2010. Les deux postes vont avoir un profil tres large (Maths Fondamentales), mais l'équipe d'Analyse figure dans la liste des équipes "prioritaires". Pour plus d'informations voir

http://math.univ-lille1.fr//

Post-doc INRIA

Vous trouverez au lien ci-dessous une offre de post-doc. a l'INRIA Sophia-Antipolis, dans l'equipe APICS (avec Fabien Seyfert, autour du projet ANR Filipix).

http://www-sop.inria.fr/teams/apics/joomla/index.php?option=com _content&view=section&layout=blog&id=5&Itemid=6

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

Pythagoras' revenge, a mathematical mystery. Arturo Sangalli, Princeton University Press, 2009, 183 p., ISBN: 978-0-691-04955-7.
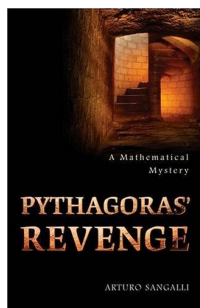

Pythagoras was born on Samos around 570 BC and has been most influential on mathematics, politics, religion and philosophy.

Pythagorean philosophy is dominated by numbers and mathematics. There were two kinds of followers: the *akousmatikoi* or "listeners" and the *mathematikoi* or "learners". It is generally accepted that his philosophy was highly influential for later philosophers like e.g. Plato. The *mathematikoi* were considered to be more advanced and better skilled in the fundamental theory. Pythagoreans were convinced that numbers rule nature (from the music of the planets to the scales of music). They also believed in the reincarnation of the soul in another animal life form, which is why they were vegetarian. The Pythagoras adepts had a lot of opposition and there was even a general uprise against them. In the second and first century BC, the original ideas were revived by the Neo-Pythagoreans.

The Pythagorean philosophy may be somewhat less known to a general public, his influence on mathematics and mathematical teaching has been very important. The Pythagorean theorem is one of the items in mathematics that seems to be accepted as belonging to the cultural backpack of anyone who pretends to be intelligent. Most of the time even politicians know the theorem, or at least it does not show bad taste to confess that one has heard of it. Ironically, the Pythagorean adepts believed in the ratio of integers and it is exactly his theorem that exposes in the isosceles case the square root of 2. Therefore Pythagoreans tried to cover this up and the Greek preferred geometry over numbers until Descartes restored numbers in the 16th century.

Pythagoras statue on Samos

Even though Pythagoras has had a big impact on Western civilization, there is no written document left from his hand. So all we know is second hand which is a source of mystery and legends. For example, there is a legend saying that his enemies had put his house on fire so that Pythagoras had to flee, but suddenly he halted, turned around and said that he'd rather die than run away, whereupon his pursuers cut his throat.
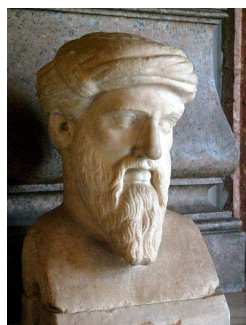

In the wake of the hype caused by Dan Brown's *Da Vinci code* Arturo Sangalli has found inspiration in all the previous characteristics of Pythagoras and the Pythagoreans to write his mathematical analog. Pythagoras being popular or at least known by many people, the mysteries about his person and the sect-like air haunting (Neo)Pythagoreanism, is indeed a good choice. Sangalli has a PhD in mathematics and as a free lance journalist has previously authored books on the interface between mathematics and computer science.

Sangalli designs a plot where a Neo-Pythagorean sect "the Beacon" believes that Pythagoras predicted that he would be reincarnated around

Pythagoras

the middle of the 20th century. So they start looking for their "Dalai Lama" via the internet. They believe that Norton Thorp, a world renown mathematician is "The One". On the other hand, there is an Oxford professor in classical history, Elmer Galway, who happens to discover a parchment book containing an Arabic translation of an old text that refers to a scroll allegedly written by Pythagoras, the Master himself. The other part of the book is discovered by the sect, so that both parties are in search of the other half of the information. Finally the papyrus scroll is found by Norton in some underground basilica in Rome[1], thanks to a carving of the tetractys, the 10-dotted triangle, a Pythagorean symbol. The parallel with the *Da Vinci Code* is striking: the mystic locations, the sect of "bad guys", the intelligent "hero" Galway, and the legacy of a secretly hidden message passed on by a great historical figure.

Tetractys
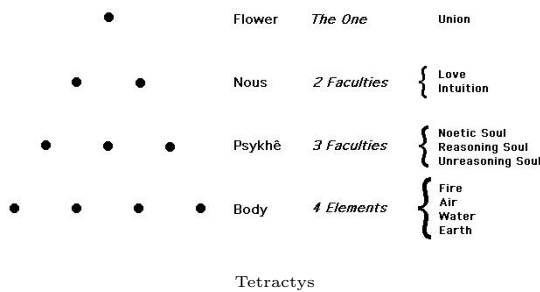
Without giving away the story, I can try to explain the title. Thorp is traced by the sect with the help of Jule Davidson, a young mathematician who is solving difficult mathematical puzzles on the internet. But Thorp turns out to be in fact an Anti-Pythagoras (in the sense of an Anti-Christ). Johanna, Jule's twin sister, is a specialist in computer security and as you may know, computer security is related to number theory and random numbers. She so happens to attend one of Thorp's lectures where he is preaching that nature is essentially randomness, i.e., completely unpredictable and therefore it is also at the heart of mathematics. "Solvable problems are like a small island in an ocean of undecidable propositions." This is of course the opposite of Pythagoras' views which means de facto the complete debacle of the sect because what Pythagoras predicted, according to their beliefs, is in fact his own anti-self.


Impossible configuration of the 15-puzzle

The book has interesting expositions about philosophy, history and of course mathematics. The latter are easily accessible for non mathematicians too. There are some appendices going a bit deeper into some of the mathematics, but often, Sangalli lets one of the characters of the book explain it. So you can find something about the unsolvable 15-puzzle and combinatorics, and about random numbers and how they are generated etc. Even lovers of mystery tales may like this story. Although the "Indiana Jones" adventure-value is rather low and some portions of the text might remind them too much of their boring mathematics lessons. This is a fiction novel after all and sometimes, me too, I find some parts of the text too much approaching lecture notes of a popular course on mathematics. Especially when one of the characters is "teaching" it feels like a bit artificial. Also the author could have saved on the number of characters. Some are introduced just to let them tell their part of the story, but they do not play a role in the rest of the novel. The suspense is kept at a good level though, and several unexpected twists in the story keep you reading on, even with the interfering "expositions" of a more philosophical or mathematical nature.

Adhemar Bultheel

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[1]This basilica near the *Porta Maggiore* on *Via Praenestina* in Rome does indeed exist and was used by the Neo-Pythagoreans in the first century AD, but it was only discovered in 1915.
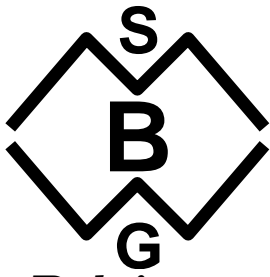
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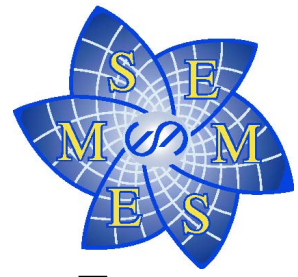
European
Mathematical
Society

Be a member of the
Belgian Mathematical Society (BMS)
and of the
European Mathematical Society (EMS)

As a member of the *BMS*

You will receive five times a year **BMS-NCM NEWS**, the Newsletter of the **BMS** and of the National Committee for Mathematics (**NCM**), containing information on what's going on in mathematics in Belgium.

You will receive the "**Bulletin of the BMS - Simon Stevin**", a periodical containing peer reviewed papers as well as book reviews.

You will benefit from reciprocity agreements with the AMS, DMV, LMS, RSME, SMF, SBPMef, VVWL and WG.

As a member of the *EMS*

You will receive a Newsletter of high interest containing papers, interviews, European meeting announcements, book reviews, . . .

You will benefit from a large discount on the "**Journal of the EMS**".

As a member of the *BMS* and the *EMS*

You are taking part in the mathematical life in Belgium and in Europe.

You give the two Societies the possibility to develop their actions: organizing meetings and lobbying with the authorities.

You provide more strength to the two Societies, enabling them to promote mathematics and its financing.

The *BMS* and the *EMS* help you

The **BMS** has conceived and promoted the on line access to the **Zentralblatt** in the Belgian Universities.

The **EMS** seeks to promote mathematics in the program of the European Union.

Activities of the *BMS* and of the *EMS*

The **BMS** has been active in organizing international congresses. **2004** Tilburg: joint conference with the Dutch Mathematical Society. **2005** Gent: joint meeting with SMF and the three BeNeLux Societies. **2005, 2007** Brussels: Ph.D. day. October 15, 2008 symposium "The mathematics of ranking" (Royal Academy), December 4–5, **2009** Leuven: joint meeting with the London Mathematical Society. Future plans: September 13 2010 Ph.D. day Royal Academy Brussels, joint meeting with RSME (Real Sociedad Matemática Española) 2012.
The **BMS** and the National Committee for Mathematics has published official standpoints in the BaMa discussion and in the use of the Science Citation Index and Impact Factors for the evaluation of mathematicians. This has been approved by the **EMS**.

The activities of the **EMS** are numerous and of high quality with the organization of the European Congress of Mathematics (ECM) every four years (Paris in 1992; Budapest in 1996; Barcelona in 2000, Stockholm in 2004, Amsterdam in 2008, 6th ECM, Krakow, July 2–7, 2012), with the Forum Mathématique Diderot, with the publication of the **Journal of the EMS**. The **EMS** as also created its own publishing house and offers a large and well-maintained collection of non-commercial journals and books on **EMIS**, the European Mathematics Information Service (www.emis.de).

Committee of the *BMS* Stef Caenepeel (VUB) (president)

Françoise Bastin (ULg) (vice-president, editor of BMS-NCM NEWS)

Jan van Casteren (UA) (secretary)	Guy Van Steen (UA) (treasurer)
Hendrik Van Maldeghem (UGent) (editor in chief of the Bulletin)	Jean Van Schaftingen (UCL)
Catherine Finet (UMH)	Eva Colebunders (VUB)
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Further information on the *BMS* and on the*EMS*:
`http://bms.ulb.ac.be/` (**BMS**) and `http://` www.euro-math-soc.eu (**EMS**).

BMS and EMS membership dues for 2008

BMS membership:	**EUR 20.00**
BMS + EMS membership:	**EUR 43.00**

Note that the **EMS** membership fee of **EUR 23** is allowed only to persons belonging to an **EMS** corporate member society. The **EMS** individual membership fee is 60 EURO otherwise.

For details on memberships: `http://bms.ulb.ac.be/membership/reciproc.php`Dues are to be paid on account number **000-0641030-54** (for EU members not residing in Belgium: IBAN BE42 0000 6410 3054; BIC BPOTBEB1)

Belgian Mathematical Society
Campus Plaine, CP. 218/01
Bld. du Triomphe, B-1050 Brussels.

Payment by credit card (EUROCARD, MASTERCARD, VISA) is also accepted but BMS members residing in Belgium at the time of billing are invited not to use it .

Registration:
Use the Membership Application form below or **register on line** at
`http://bms.ulb.ac.be/membership/appl-form.php`

The last year you have paid your membership dues can be found on the address label.

Membership Application/Renewal Form 2010

to be sent to
Belgian Mathematical Society
c/o Jan van Casteren
Campus Plaine, CP. 218/01
Bld. du Triomphe, B-1050 Brussels.

Name: ....

Address: ....

Postal code:.....................**City:**....................**Country:**......................

E-mail:..

Occupation:.............................**Place of Work :**...............................

Please tick the appropriate lines:

☐ I want to be an ordinary member of the **BMS** (EUR 20.00).

☐ I apply for a BMS reciprocity membership (EUR 18.00); I am a member of the ....
(see page 1 for the list of the reciprocating societies).

☐ In addition to my BMS membership, I want to be a member of the EMS (add EUR 23.00).

☐ I do not agree that the Newsletter BMS-NCM News be sent to me by e-mail (as an attached
.pdf file). Members are strongly advised to have the Newsletter sent by e-mail.

☐ I do not agree that my affiliation and e-mail address are published.
   affiliation: ....
   address: ....
   e-mail: ....

☐ I do not agree that my affiliation and e-mail address are made available on the web site
of the BMS.

☐ I shall pay my dues, which in total amount to ...,...EURO on account number
000-0641030-54 of the BMS: (for EU members not residing in Belgium: IBAN BE42 0000
6410 3054; BIC BPOTBEB1)

☐ Please charge my credit card to the amount of ...,...EURO

☐ VISA   ☐ EUROCARD   ☐ MasterCard

Card number: | | | | | | | | | | | | | | | | | | | |

Expiration Date: | | | | | |

Date: Cardholder's signature: ....