BELGIAN MATHEMATICAL SOCIETY

Comité National de Mathématique   CNM

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NCW   Nationaal Comite voor Wiskunde
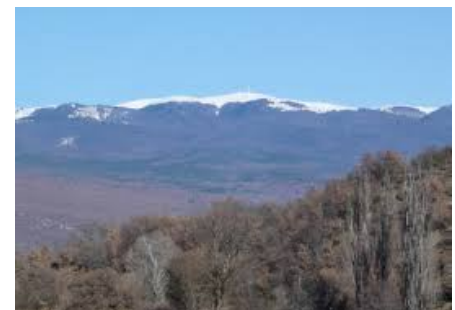
BMS-NCM NEWS

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No 96, January 15, 2014

Letter from the editor

Welcome to this first Issue of our Newsletter for 2014

Have a nice winter time!!

Regards, Françoise
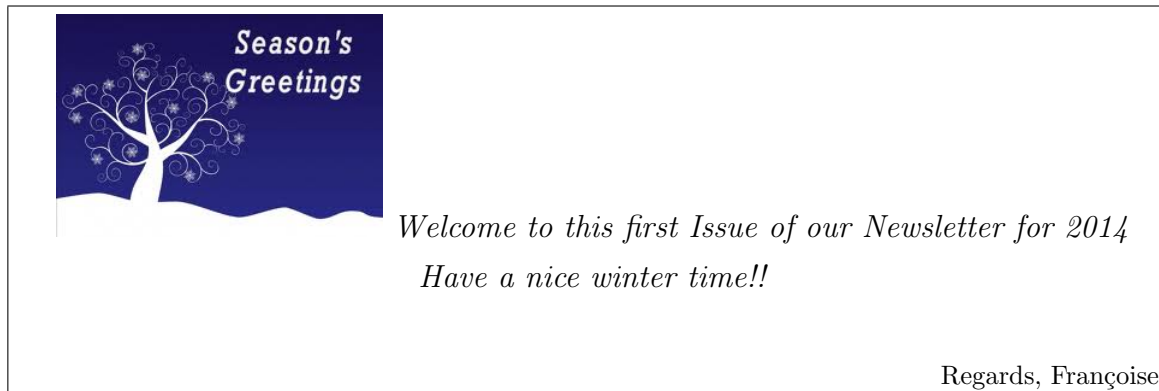
Contents

1 News from the BMS & NCM

1.1 Membership

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

> **the renewal of your membership to our society!**
> *Many thanks for your support*

1.2 Bulletin of the BMS - electronic version

We remind you that it is possible to convert your paper subscription to the Bulletin of the BMS into **the electronic version of the Bulletin.** *If you are interested, please contact Philippe Cara by e-mail* (pcara@vub.ac.be with bms@ulb.ac.be in cc) for details.

You will receive a special "subscriber code" with which you can register for the Bulletin of the Belgian Mathematical Society at Project Euclid (http://projecteuclid.org).

2   Meetings, Conferences, Lectures

2.1   February 2014

One day colloquium on Galois Geometry
Friday February 28, 2014 — Ghent

On November 27, 2013, our colleague Frederic Vanhove, 29 years old, passed away. To his memory, a one day colloquium on Galois Geometry is organised in Ghent on Friday February 28, 2014.

<u>Organizers</u>: Jan De Beule, Leo Storme, Hendrik Van Maldeghem

<u>Speakers</u>. We are very pleased that the following speakers could accept our invitation to give a talk:

- Chris Godsil (Waterloo)

- Willem Haemers (Tilburg)

- Ferdinand Ihringer (Giessen)

- Bill Martin (Worcester, Massachusetts)

- Akihiro Munemasa (Tohoku University, Sendai)

- Valentina Pepe (Naples)

<u>Location</u>: Ghent University, Department of Mathematics, Krijgslaan 281, Building S25, Emmy Noether Lecture Room, 9000 Ghent.
<u>Practical information</u>. Participation, lunch, and coffee for free. Please register at jdebeule@cage.ugent.be before February 20, 2014. The same address can be used for more information.

2.2   June 2014

FNRS group "Functional Analysis"
Thursday-Friday, June 12-13, 2014 — Esneux (Liège) , Domaine du Rond-Chêne

Following the tradition, the FNRS group "Functional Analysis" will meet next June (June 12-13, 2014). The meeting will take place in the small town of Esneux, in the "Domaine du Rond-Chêne".
More information will soon be available.
<u>Contacts</u>: Françoise Bastin (F.Bastin@ulg.ac.be) or Catherine Finet (catherine.finet@umons.ac.be)

3   From the EMS

3.1   Newsletter

The December 2013 issue of the Newsletter of the EMS is on line:

http://www.ems-ph.org/journals/newsletter/pdf/2013-12-90.pdf

4   Miscellaneous

4.1   From University of Antwerp

As of October 1 2014 ***a position of a full professorship in the domain of Analysis*** has to be filled at the University of Antwerp, Department of Mathematics and Computer Science. The deadline for applications is February 23 2014. For more information about the contents of this position the (possible) applicant should contact professor Wim Vanroose, e-mail: wim.vanroose@uantwerpen.be -TEL 03 265 33 13. The application can be done online; for technical advice the applicant may contact Ellen Huijer (TEL 03 265 31 45) or Robin Wynants (TEL 03 265 31 41) of the Personnel service.
For more explanation (in Dutch) see https://www.uantwerpen.be/nl/jobs/vacatures/ap/2013zapfdwisex204/
For more explanation (in English) see https://www.uantwerp.be/en/jobs/vacancies/ap/2013zapfdwisex204/

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

In the Dark on the Sunny Side: A Memoir of an Out-of-Sight Mathematician, 2012, Mathematical Association of America, ISBN 978-0-88385-581-2 (hbk), 206 pp. MAA Spectrum Series, by *Larry Baggett.*

Lawrence W. Baggett

Five year old Lawrence W. Baggett accidentally cut himself (he claims it is a design error of Darwinian evolution that arranges bone lengths in a human arm such that if you cut something at eye level, the knife will end up in your own eye). By sympathetic ophthalmia, he lost sight in his other eye as well, which left him totally blind apart from some vague distinction between light and dark.

That was 1944, and in those days, mainstreaming people with some bodily malfunction was not as usual as it is today. However, his mother was very determined and could convince some teachers to take her son along in the class with the other kids. Similar things happened later when he continued his education. He was always lucky to be the first blind person who was accepted in a regular program. He finally got a PhD at the University of Washington in 1966 on unitary representations of compact groups. After that he was hired by the University of Boulder where he had 12 PhD students.

With the technology available to us today, such as computers, audio-books and TEX, we can imagine a blind person writing a paper, but this was not at all obvious forty years ago. At first Braille typewriters were very primitive, and even when they improved, there was no erase button. Hence it required a lot of re-typing. Some books were available in Braille, others were later audio-recorded. For reading a paper he was depending on somebody reading it out for him. He tells us many other things that a blind person has to deal with, like traveling, finding your way in an unfamiliar city, crossing streets with heavy traffic, finding an empty seat in the audience, using a self-service counter, or the use of public toilets, and obviously how to lecture in a theater for a group of sighted students. Baggett takes us along on this journey, embedded with a sauce of gratefulness and a lot of humour. His hilarious evocation for example of what may happen when an unsighted man in a public lavatory is looking for a free toilet booth or when he bumps into the rear of a peer (or is there an 'e' missing) looking for a free urinal. Just a quote to illustrate his tongue-in-cheek phrasing *"It is known to people who do research on blindness that most blind men and women can't accurately walk a straight line, which I suppose explains why so many of us get drunk-driving tickets".* Until late in life, he avoids being exposed as a blind person and act as sightedly as possible. That may be the reason that he never used a guide dog (at least he never mentions one in this memoir), although he came around to using a cane.

Baggett takes us along the successive stages of his personal life and of general history (e.g. the 'revolutionary sixties', the day JFK was shot, etc.). He tells about his escapades as a student, the "girly-thing" as a teenager, how he travelled to Sweden (partly inspired by the reputation of Swedish girls), how he met his first wife, and how he later remarried with his current wife, and how he got along after being elected as head of the math department in Boulder. It is remarkable how often the reader is almost forgetting that this is a blind person telling this story. He tells about the movies he has *watched*, the paintings he has *seen* in a museum, etc. but these words get a slightly different meaning, obviously.

Besides mathematics, music has been another lifelong passion of his. He has played in several bands as a youngster and continued to do so during his later career. Both of these passions are illustrated not only by his story, but there are several framed text blocks inserted that elaborate on some of the topics that he mentions. These are not really advanced, but discuss things like the number of possibilities in a set of 6-6 domino tiles (inspired by the 163 possibilities formed by a 6 by 2 dot matrix of the Braille alphabet), or the comma of Pythagoras, the sequence of musical chords, the limit of a sequence of numbers, the irrationality of $\sqrt{2}$, mathematical induction, etc. Sometimes he just challenges the reader giving a question of an IQ test he had to do: what is the next number in the sequence 6, 42, 7, 12, 48, 16, 18.

This account is indeed 'on the sunny side' (and this probably refers to the jazz standard song 'On the sunny side of the street' performed by many if his much admired jazz heros). Apart from his accident as a child, Baggett may have been lucky at many other instances of his life, nevertheless this book testifies that, even 'in the dark' it is possible by using one's creativity and perseverance to achieve remarkable things in life.

Adhemar Bultheel

Manifold Mirrors. The Crossing Paths of the Arts and Mathematics, 2013, Cambridge University Press, ISBN 978-0-521-42963-4 (hbk), x+415 pp. by *Felipe Cucker*.
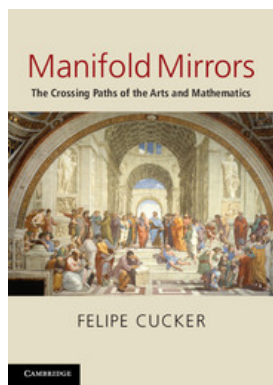
Felipe Cucker

The cover states that this book grew out of a liberal arts course. Felipe Cucker is Chair Professor of Mathematics at the City University of Hong Kong. The result is a collection of chapters, some of which are just plain mathematics, others analyse the philosophical and psychological aspects of aesthetics, and of course many discuss a wide diversity of works of art and how the mathematics are recognized in their features (like symmetry or translation invariance for example) or how mathematics have influenced the techniques available to the artists (like perspective and hyperbolic geometry).

Almost all examples are two-dimensional, which is related to the mathematics that are covered. These are all geometric, many treat transformations in the plane, but others deal with projections, and non-Euclidean geometry. So most art examples are graphical like paintings and carpets, but occasionally also poetry and dance performances. The chapter devoted to Bach's canons, is and exception. Architecture and sculpture, which are three-dimensional, are almost absent.

But let us go more systematically through the contents of the book. It starts with some appetizers: The famous *Maestà* fresco of Simone Martini (1284-1344), John Milton's (1608-1674) *Paradise lost* (his blindness draws a parallel with Jorge Luis Borges (1899-1986)), and Johan Sebastian Bach's (1685-1750) *Musical Offering*. It gives a short biography of the artists, but mainly discussing the symmetry, rhythm, structure in their work.
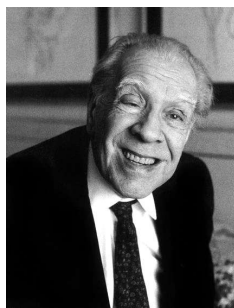
S. Martini   J. Milton   J.L. Borges   J.S. Bach

Then a chapter introduces geometry and its history from Euclid to Descartes and this is followed by a mathematical treatment of plane transforms: translation, rotation, reflection, glide, isometry, completely with definitions and proofs. Artistic examples illustrate the mathematics in another chapter where it is shown that there are exactly 7 friezes (translation invariant pattern in one direction) and 17 wallpapers (translation invariant pattern for two independent vectors).

Pieces of art with planar symmetry are easily found. Tessellations of the plane are very common in islamic decoration. However Cucker chooses rugs and carpets from Central Asia and Chinese lattices as the main illustrations to be accompanied with the obvious choice of M.C. Escher's (1898-1972) work.
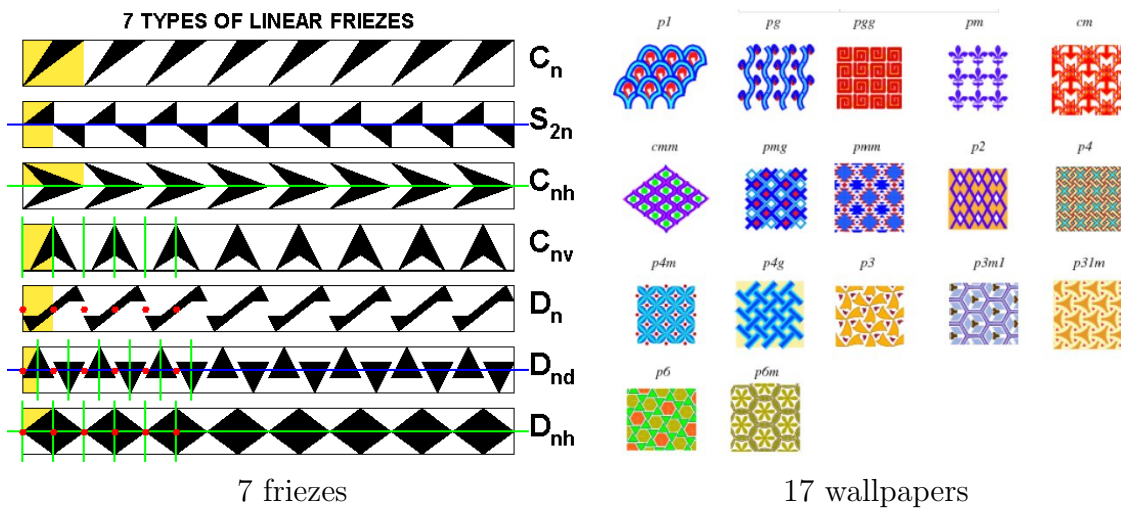
Much more philosophical is an analysis of George D. Birkhoff's (1884-1944) *Aesthetic Measure* who actually derived a formula which was the ratio of the amount of symmetry over the complexity of the object. It is followed by
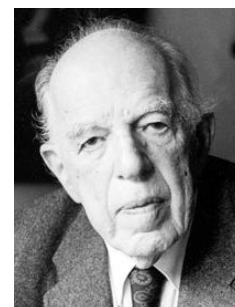

G.D. Birkhoff   E.H. Gombrich

7 friezes

17 wallpapers

the theory of the art historian Ernst H. Gombrich (1901-2001) about our *sense of order*. An object raising a sense of beauty has found a balance between complete disorder and boredom. Think of a regular square grid. That might be interesting if you want to solve your differential equation, but it is aesthetically very dull. On the other hand our brain perceives symmetry when it is not really there. For example the *Vitruvian man* by Leonardo Da Vinci is not symmetric. Hardly noticeable but the left leg and foot are rotated with respect to the right one. This delicate balance is illustrated by several examples from op-art, by the repetitions in work of Andy Warhol (1968-1987) with his *Campbell's Soup* cans or his screenprints of *Marilyn Monroe*, but also with several ballet scenes like for example the rotational symmetry evocated by the *Pilobolus Dance Theater* which is not perfect either. Also the regularity in rhyme and rhythm like iamb, trochee, dactyl, and anapest.
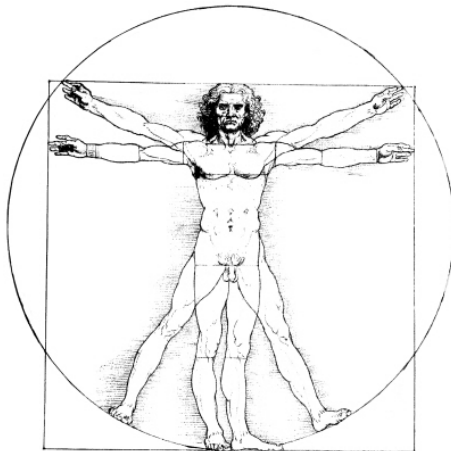

Vitruvian man

The next chapter starts out again with mathematics introducing homothecies, the group of similarities, shears, strains and affinities. This brings along conics and the optical spiralling effect even though there are only concentric circles in the *Fraser spiral*, the effect is obtained by the sheared black rectangles. The ellipse used during the Renaissance gets some special attention. It can be seen as a prolonged version of the perfectly symmetric circle. These can be observed for example in paintings by Peter Paul Rubens (1577-1640), but also in the elongated bodies in the paintings by El Greco (1541-1614). The chapter ends with Klein's *Erlangen Program* to classify geometry (not fully explained here) and other possible representations of reality like topologies (think of a map of a metro system).

Marilyn Monroe
A. Warhol

Pilobolus
Dance Theater
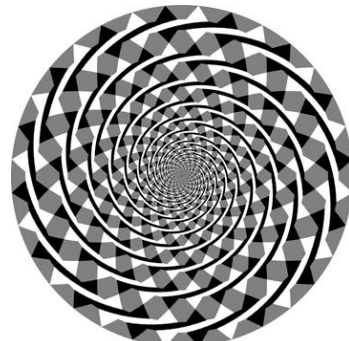
Fraser spiral

Saint Martin
El Greco


Exchange of Princess
P.P. Rubens

The chapter with a slightly unexpected title *Aural wallpaper* introduces several terms related to music scores and then defines the 'geometry of canons' (in terms of translations and symmetries). All in preparation of a more extensive discussion of the 10 canons from J.S. Bach's *Musical Offering* and motifs used by others, arriving at work by Satie and Riley and minimal music. The end of the chapter explores an essay by Peter Kivy (1993) who is defending the role of music as 'aural wallpaper'.
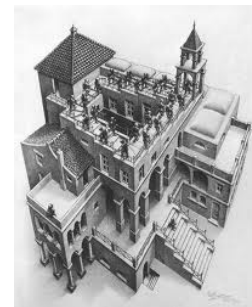

The Ambassadors
H. Holbein
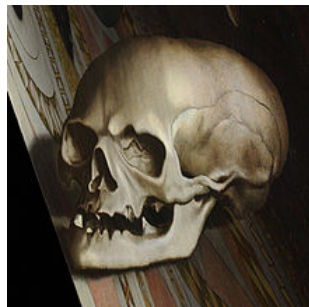
rescaled skull
left fig. center front
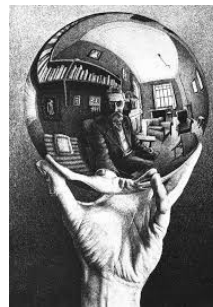
reflection in sphere
M.C. Escher

ascending and descending
M.C. Escher

Back to geometry, Cucker shows how perspective was gradually introduced by European painters and gives some of the mathematics and elements from projective geometry and different kinds of projections. This lead to a conflict between composition and the rules of perspective, or distortions like the paintings on the ceiling of some churches. A remarkable example of distortion is the skull on the painting *The Ambassadors* by Hans Holbein (1497-1453). It appears as a strange elongated object at the center front and it can only be recognized when the painting is looked at from a very small angle. There are of course the many reflections in spheres and convex mirrors made possible, but also the many impossible constructions obtained by false perspective (e.g. M.C. Escher). Less


Trinity (A. Rublev)

known is the divergent perspective like in the *Trinity* icon by Andrei Rublev (ca. 1360-1428). The feet of the angels rest on trapezoidal forms whose sides converge towards the observer. The chapter ends where painters abandon perspective like e.g. in *Les Demoiselles d'Avignon* (1907) by Pablo Picasso (1881-1073), considered to be the start of cubism and modern art.

Just as in art the classical rules were abandoned, also in mathematics the geometry of Euclid was abandoned. Cucker goes through the trouble of defining formal axiomatic systems and formal languages, and even formulates Gödel's completeness theorem. This allows him to define models for Euclidean geometry, but also Poincaré's model for hyperbolic geometry, and non-Euclidean geometries like projective and spherical geometry. This opens the route towards tessellations of the sphere, and the projective and hyperbolic plane where again Escher is the obvious illustrator of these.

In a final short chapter, Cucker ponders on the question whether there is a 'true' geometry. One that represents reality. So he makes an excursion, leaving 2-dimensional geometry and arrives at general relativity, space-time structure and the topology of our universe.

In an appendix some ideas about 'rule-driven creation' is given. The creation of art is not just a matter of following the rules, because then it could be automated, but neither is it not following any rule. So far, with only few exceptions, what has been discussed was mainly 2-dimensional visual art (apart from the chapter on audio wallpaper). Cucker takes up this occasion to discuss literature, which also follows certain rules, except that he did not clearly see the geometric concepts in this creation process. There are however exam-

Circle Limit III (Escher)

ples of constrained writing like the extreme use of anagrams, palindromes and other word plays. Famous is *La Disparition* (1963) by Georges Perec (1936-1982), a lipogram novel in which the letter 'e' does not occur or his *Les Revenences* (1972) in which 'e' was the only vowel.
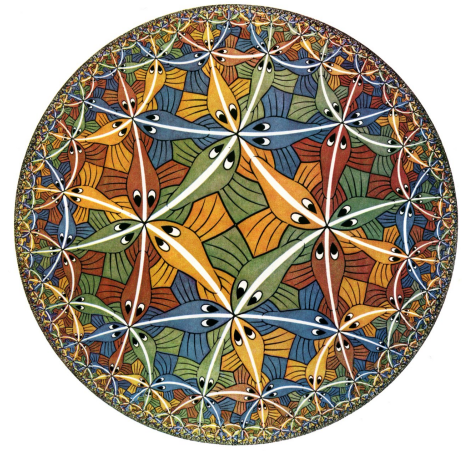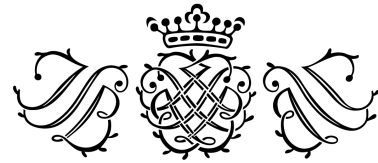

Satire of false perspective
W. Hogarth

Les demoiselles d'Avignon
P. Picasso

Symmetry in J.S.Bach's seal
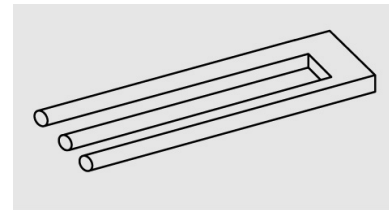
Impossible object

This survey shows that even though the author has restricted his approach mainly to two-dimensional geometry and transformations of the plane, it should be clear by now that this is still a very broad area when this is related to visual art. The result is an unusual mixture of proper mathematics, practical illustrations from global cultural heritage covering human history from the stone age till modern art, and a discussion of philosophical and psychological essays. The choice of the art works are not always the most well known. So there will be most likely something new to discover for every reader. The book grew out of a course, and so it is certainly possible to extract some interesting lectures from the material that is presented.

Adhemar Bultheel
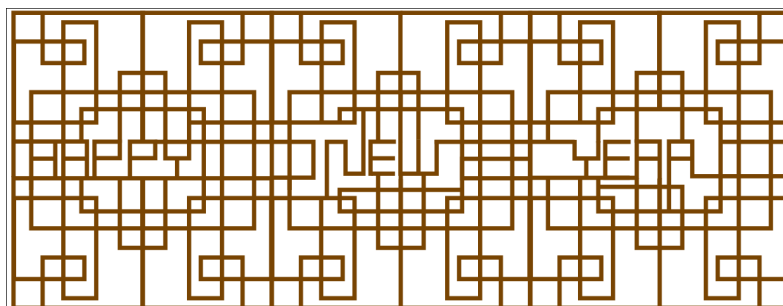
Chinese lattice
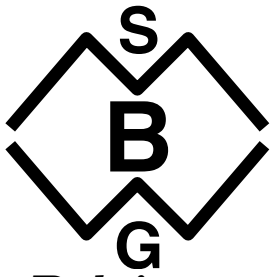
Belgian Mathematical Society

European Mathematical Society

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and of the
European Mathematical Society (EMS)

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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.

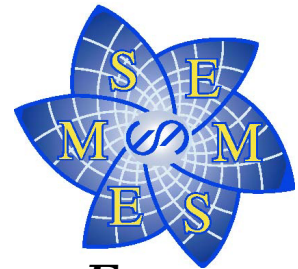You will receive the "**Bulletin of the BMS** - **Simon Stevin**", a periodical containing peer reviewed papers as well as book reviews. The Bulletin of the BMS–Simon Stevin will also be made available electronically for members of the BMS.

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 and other meetings: Leuven: joint meeting with the London Mathematical Society, September 13 **2010** Ph.D. day Royal Academy Brussels, November 9 **2011**: Mathematics and Teaching (Royal Academy Brussels), joint meeting with RSME (Real Sociedad Matemática Española) and SML (Luxembourg Mathematical Society June 6–8, **2012**, Ph.D. day September 9, 2013. Future activities will be in a similar spirit. 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 (6th ECM, Krakow, July 2–7, 2012, 7th ECM, July 18 - 22, Berlin 2016), with the Diderot Mathematical Forum (last one took place on December 17, 2013: Mathematicians from Berlin (Germany), Exeter (UK) and Zagreb (Croatia) gave lectures), 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*

Françoise Bastin (ULg) (president)	Hendrik Van Maldeghem (UGent) (vice-president)
Jan van Casteren (UA) (secretary)	Guy Van Steen (UA) (treasurer)
Stef Caenepeel (VUB) (editor in chief of the Bulletin)	Philippe Cara (VUB)
Andreas Weiermann (UGent)	Eva Colebunders (VUB)
Pierre Bieliavsky (UCL)	Camille Debiève (UCL)
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Michel Van den Bergh (UHasselt)	Freddy Dumortier (UHasselt)
Adhemar Bultheel (KUL)	Stefaan Vaes (KUL)

 Further information on the BMS and on theEMS:
`http://bms.ulb.ac.be/` (***BMS***)   and   `http://` www.euro-math-soc.eu (***EMS***). ***BMS*** and ***EMS*** membership dues for 2014

BMS membership/Reciprocal ***BMS*** membership: **EUR 20,00/ EUR 18,00**

BMS + ***EMS*** membership: **EUR 44,00**

Reciprocal BMS + ***EMS*** membership: **EUR 42,00**

Note that the ***EMS*** membership fee of **EUR 24** is allowed only to persons belonging to an ***EMS*** corporate member society. The ***EMS*** individual membership fee is 48 EURO otherwise. For details on memberships: `http://bms.ulb.ac.be/membership/reciproc.php`
For members from the EU dues are to be paid on the **NEW** account number
IBAN: BE70 0011 7447 8525; BIC: GEBABEBB

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

Payment by credit card is not possible anymore, but payment via PayPal will be accepted. Use `http://bms.ulb.ac.be/membership/paypal.php`
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 2014

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 24,00).

☐ I do not agree that the Newsletter BMS-NCM News be sent to me by e-mail (as an attached
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☐ I do not agree that my affiliation and e-mail address are published.
    affiliation: ....
    address: ....
    e-mail: ....

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of the BMS.

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membership dues via the account number mentioned above.

Date: Signature: ....