Newsletter

BELGIAN MATHEMATICAL
SOCIETY

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Comité National de Mathématique   CNM

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NCW   Nationaal Comité voor Wiskunde

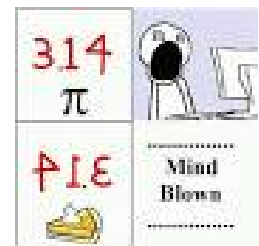# 112, March 15, 2017

Contents

Thanks for the content!

I started last issue of our Newsletter with a call for more input from BMS members. During the last meeting of the board it was decided to send an e-mail to all members two weeks before appearance of the Newsletter. This had some effect! Thank you to all members who sent us information. This small effort helps us tremendously and makes the Newsletter more interesting for everyone.

Examples of information we are seeking are: PhD defenses, seminars, conferences, workshops, meetings, interaction with other sciences or business companies, popular lectures, school initiatives, math exhibitions, . . .

Next Newsletter will appear on May 15. The deadline for contributions is May 5. Contact Françoise Bastin <F.Bastin@ulg.ac.be> with all information you want to share!

I also welcome suggestions to make the Newsletter more attractive or useful. A recent suggestion was for example to present departments or research groups in our Newsletter. This is a very good idea I think. Many things have changed in the past few years. Universities collaborate with other institutions or private companies and create larger groups. It is difficult to keep track of all changes that happen in Flanders and Wallonia. This is certainly true in the field of math education at high school level but also in universities and research policy. We will shed light on the high school education during our next BMS event in May. For the other topics it would be great to have some small articles for the Newsletter. Maybe your department was recently restructured? Or maybe the math curriculum was reformed at your university. I am sure our readers would like to know about all this! Please send us your short (or long) contributions.

Last week we finalized the programme of our joint conference with the math teacher's associations. We produced some very nice posters, one of which you can find at the end of this Newsletter. This unique 3-day joint event will be organised in the city centre of Brussels (Maria Boodschap Lyceum, Moutstraat 22, 1000 Brussel) at a few minute's walk from the central railway station. The dates are 25–27 May 2017. We hope to welcome many of you!

May I please ask you to announce this conference to all your colleagues and students? You should especially recommend this conference to teachers around you. Registration for the conference is now open. There is a small registration fee to cover lunch and coffee breaks during the conference. All information will be kept up to date on our dedicated website:

<div align="center">http://www.themathconf2017.be</div>

And remember. . .

You can follow `BelgianMathS` on twitter and tweet announcements or other interesting information to @BelgianMathS.

We also have a facebook page: https://www.facebook.com/BelgianMathS. This page is your page! Please help us to keep it up to date and interesting by sending us nice links and information to Yvik Swan yvik.swan@ulg.ac.be

Philippe Cara,
BMS president

1   Meetings, Conferences, Lectures

1.1   May 2017

Joint congress of BMS with Belgian Mathematics Teachers' Associations VVWL and SBPMef

Brussels, May 25th – 27th, 2017

La Société Belge de Mathématique (SBM) organise, les 25, 26 et 27 mai prochains, un congrès à Bruxelles conjointement avec les associations d'enseignants de mathématiques des deux côtés de la frontière linguistique.

On May 25th – 27th, 2017, the Belgian Mathematical Society will organise a joint conference in Brussels with the mathematics teachers' associations of Flanders and Wallonia.

Van 25 tot 27 mei 2017 zal het Belgisch Wiskundig Genootschap in Brussel een gemeenschappelijk congres organiseren met de verenigingen voor wiskundeleraren van beide kanten van de taalgrens.

REGISTRATION IS NOW OPEN!!!

Registration fee: you can participate on 1, 2 or the full 3 days of the conference. To cover lunch and coffee breaks, we ask for a small participation fee: 30€ for 1 day, 40€ for 2 days and 50€ for 3 days.

Location: Maria Boodschap Lyceum, Moutstraat 22, 1000 Brussel.

Program:

- **Plenary speakers:**
    - Rik Verhulst (former teacher and lecturer, author of many mathematics books): *De unieke wordingsgeschiedenis van de wetenschappelijke methode en haar baanbrekende wonderen*
    - Giovanni Samaey (KULeuven): *X-Factor: verhalen over de onzichtbare kracht van wiskunde*
    - Dirk Huylebrouck (Sint-Lucas): *Wiskunst*
    - Davy Paindaveine (ULB, Godeaux Lecture): *TBA*
    - Jeanine Daems (One of the "Wiskundemeisjes"): *History of mathematics in math education*
    - Jean Doyen (ULB): *Itérées de fonctions : de Conway à Mandelbrot en passant par Syracuse et les prévisions météo*
    - Jean Mawhin (UCLouvain): *Nombres premiers : des éléments d'Euclide à la conjecture de Riemann*
- **Afternoon:** Several workshops for teachers and academics: see website: http://www.themathconf2017.be
- **Late afternoon/evening:**
    - MathsJam
    - Round table discussion on *the role of the mathematics teacher in education*.

Each day of the conference will be in a different language (Flemish, English, French).

Website: http://www.themathconf2017.be or http://bms.ulb.ac.be/mathconf2017/.

Organising committee: Michel Sebille, Christian Michaux, Isabel Goffa, Filip Moons, Yvik Swan, Philippe Cara.

See also the posters available for download on the website and the one at the end of this Newsletter.

1.2 May-June 2017

<div align="center">

Chaire de la Vallée Poussin

May 30-31 and June 1, 2017

UCL

Professor George Janelidze

</div>

We are very pleased to inform you that this May, Professor George Janelidze will be the recipient of the prestigious Chaire de la Vallée Poussin 2017 (see https://uclouvain.be/fr/instituts-recherche/irmp/chaire-de-la-vallee-poussin-2017.html) at the Université catholique de Louvain.

On this occasion, professor Janelidze will give a series of invited lectures entitled

<div align="center">

From Galois theory to commutative Hopf algebras and finite topological spaces

</div>

Abstract
These lectures are about Galois theory, which begins with field extensions, makes several steps of wide generalization, and eventually arrives at a purely category-theoretic level, where it gets new motivation and many new expected and unexpected examples. These examples will be described, with special remarks on commutative Hopf algebras that appear as Galois groups, and the whole last lecture devoted to algebraic topology of finite spaces, where the Galois theory of covering spaces works especially well.

Schedule

- Tuesday, May 30, 16:30: "Evolution of Galois theory"

- Wednesday, May 31, 11:00: "Categorical foundation"

- Wednesday, May 31, 16:30: "Concrete Galois theories"

- Thursday, June 1, 10:00: "Algebraic topology of finite spaces"

Then, a workshop will follow

<div align="center">

Workshop on Categorical Methods in Non-Abelian Algebra

June 1st to 3rd, 2017

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Please, let us know as soon as possible if you want to participate by sending a message to

tim.vanderlinden@uclouvain.be

Participants are warmly invited to present talks. The deadline for registration and abstract submission is April 30, 2017.

Further information can be found at the workshop webpage

http://www.mat.uc.pt/˜mmc/mcana/MCANAfifthworkshop.html

Looking forward to seeing you in Louvain-la-Neuve,

The organizers

Alan Cigoli, Maria Manuel Clementino
Marino Gran, Tim Van der Linden
Joost Vercruysse, Enrico Vitale

See also the poster at the end of the Newsletter.

1.3 June 2017

Fourth Young Mathematicians Colloquium

Friday June 2, 2017 at the Vrije Universiteit Brussel

For the fourth time we organize the Young mathematicians colloquium (YMC) which gathers PhD students and post-doctorants from Belgium and from the North of France. The colloquium will take place during a full day at the Vrije Universiteit Brussel. The goal of the day is to bring together applied and pure young mathematicians from all fields of Mathematics from different neighbouring universities. The day will consist of 3 broad (mathematical) public talks of 1 hour delivered by confirmed researchers. Moreover, there will be as well a round table held by former PhD students in mathematics on the topic: "What are the career opportunities after a PhD degree in Mathematics?". More details and registration on the website of the colloquium

http://www.mathconf.org/ymc2017

Speakers:

- Christophe Ley, Ghent University: "Does one have to be normal to be normal?".

- Thomas Rey, University Lille 1: "Kinetic theory of gases: from Boltzmann to Hilbert's 6th Problem".

- Luc Vrancken, University of Valenciennes, "The Magid-Ryan Conjecture".

Looking forward to meeting you at this colloquium!

Best Wishes,

The organizers

Loïc Gaillard, Alfonso Garmendia
Geoffrey Janssens, Marilena Moruz
Miruna-Stefana Sorea and Antoine Zurek

Meeting of the FNRS Functional Analysis group

June 8-9, "Domaine des Masures", Han-sur -Lesse

The list of invited speakers is the following (alphabetical order)

- T. CIAS (Poznan)

- L. DEMEULENAERE (ULg)

- J. FALCO (post doct UMons)

- D. GARCIA (Valencia)

- D. JORNET (Valencia)

- T. KALMES (Chemnitz)

- S. SCHLUETERS (Oldenburg)

Information: Françoise Bastin (F.Bastin@ulg.ac.be) or Catherine Finet (Catherine.Finet@umons.ac.be)

Groups, Rings and the Yang-Baxter equation

Spa, June 18th - 24th, 2017

A conference on "Groups, Rings and the Yang-Baxter equation" will be held at Domain Sol Cress in the beautiful town of Spa, Belgium. The international conference focusses on recent developments in the areas of ring theory, group theory and the new structure, called braces, that recently has attracted a lot of attention because of its role in a description of set-theoretic solutions of the Yang-Baxter equation. Special emphasis is given on the relations between these areas and in particular on topics where a mixture of methods (involving these theories) has been used. Some topics of particular interest are: group rings, unit groups, (graded) rings and also various algebraic structures used in the context of the Yang-Baxter Equation.

See poster at the end of this newletter and http://homepages.vub.ac.be/abachle/gryb/

First days of nonlinear elliptic PDE in Hauts-de-France

26 -29 juin 2017, ISTV, Valenciennes,

See the web page at the address https://sites.google.com/site/edpnlvalenciennes062017/ and the poster at the end of the Newsletter.

1.4   August 2017

Pure and Applied Differential Geometry - PADGE 2017

Leuven, August 21st - 25th, 2017

This conference is organized by the geometry section of KU Leuven and will cover topics from

- Riemannian geometry, Lorentzian geometry, submanifold theory
- Poisson geometry, symplectic geometry, foliation theory

All information on this conference can be found on the website:

wis.kuleuven.be/events/padge2017

Confirmed invited speakers are

- Ilka Agricola (Philipps-Universität Marburg)
- Bang-Yen Chen (Michigan State University)
- Rui Loja Fernandes (University of Illinois)
- Haizhong Li (Tsinghua University)
- Ionut Marcut (Radboud Universiteit Nijmegen)
- Eva Miranda (Universidad Politecnica de Catalunya)
- José Senovilla (Universidad del Pais Vasco)

2   PhD theses

Will you defend your PhD soon? Do you have a student who is about to obtain his PhD?

Grab the opportunity to announce it in our Newsletter!

Next Newsletter will appear on May 15. The deadline for contributions is May 5. Contact Françoise Bastin <F.Bastin@ulg.ac.be> with title, abstract and defense date/place.

3   From the IMU

To: The Adhering Organizations of the International Mathematical Union (IMU)

Dear colleagues,

This is a short-term notice regarding the

5th Heidelberg Laureate Forum (HLF),

see http://www.heidelberg-laureate-forum.org which will take place in

Heidelberg, Germany during September 24 – 29, 2017.

At HLF all winners of the Fields Medal, the Abel Prize, the Alan Turing Award and the Nevanlinna Medal, and this year for the first time the ACM Prize in Computing, are invited to attend. In addition, young and talented computer scientists and mathematicians are invited to apply for participation. The previous HLFs have been an exceptional success. The HLF serves as a great platform for interaction between the masters in the fields of mathematics and computer science and young talents.

Applications for participation at the 5th HLF are open in three categories: Undergraduates, PhD Candidates, and PostDocs. See the webpage

www.application.heidelberg-laureate-forum.org

for the online application form and further information. The IMU Adhering Organizations and national mathematical societies can nominate young researchers. Nominated persons get "priority treatment", but, since there may be too many nominations, they have no acceptance guarantee. During the nomination process you will be asked for an Org-ID, which is IMU47278 for the IMU. The deadline for application is February 14, 2017.

IMU asks its Adhering Organizations to distribute this information among their national mathematical communities, if possible through the newsletters of the national mathematical societies.

The HLF was initiated by the late German entrepreneur Klaus Tschira, and is supported by the Klaus Tschira Foundation, The Norwegian Academy of Science and Letters, The Association for Computing Machinery, as well as The International Mathematical Union.

Regards

Helge Holden

Secretary of the International Mathematical Union
http://www.mathunion.org
Phone:+47-92038625

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

4.1 Adhemar's corner

And as usual, but always to be read with great pleasure, here are some reviews from Adhemar Bultheel.

4.2 Pi-Day

And on this special occasion (Pi-Day!!) here is a review by Paul Levrie.

4.3 Our conference poster (see also website for full size versions)

The Wild Numbers / De wilde getallen *Philibert Schogt* Phoenix / De Arbeiderspers, 2000 / 1998, ISBN 978-1568581668 / 978-9029537315 (pbk), 160 pp.

Isaac Swift, the main character of this novel, is a mediocre mathematician of 35 working at an American university. Since he was a kid he was obsessed by numbers and pure mathematics. He has an ex-wife who could not stand his excitement for mathematics and he is terrorized by a nutty older student Vale who is attending his class. At some point Vale gives him a manuscript that Swift puts aside without reading but it triggers him to look at an old problem again. It was formulated in 1823 by Anatole Millechamps de Beauregard who challenged his friends to solve a puzzle within a week. Unfortunately, he was murdered, the solution was unknown, and it became an open problem in number theory. Mathematicians tried hard to prove that there are infinitely many different wild numbers where the wild number w_n is defined as follows. Start with n, apply a number of operations resulting in a sequence of rationals numbers. If the sequence eventually ends up to be integer again, then this is w_n. If the sequence does not end, $w_n = 0$.

Swift starts working like crazy on the problem, balancing between despair and obstinacy. Then with a flash of insight he believes he has cracked the problem. All the disregard he got from his colleagues will be over and he will gain all the praise and glory he deserves. A colleague in his department, Dimitri Arkanov, had revived the problem earlier in the 1960s by linking the wild numbers to prime numbers. Together they go through the proof and find it to be correct. Swift prepares a paper that is mailed to the prestigious journal *Number*. Vale happens to spot the manuscript and accuses Swift of plagiarism. He attacks and injures Swift. When other colleagues, after the fight between Vale and Swift, also have a look at the manuscript, it turns out to have a flaw at the very beginning, resulting in a non-proof because it is implicitly assuming from the start what has to be proved. Swift's life pulls back to resignation.

What is good about the novel is that Schogt who studied philosophy with mathematics on the side seems to have understood how mathematics can be addictive and that the switch between despair and euphoria is almost instantly after a moment of insight when all the pieces of the puzzle fit together. Swift, the mathematician, is also sketched as a 'normal' person, not the stereotype of the autistic alien.

Of course the wild number problem is fictitious but it reminds one of the $3n + 1$ problem also known as the Collatz conjecture, and several other names too. It is another sequence problem. Take any natural number. If it is even, divide by 2 and if it is odd multiply by 3 and add 1. The conjecture is that the sequence will always arrive at 1. It has been investigated by many, but there still is no proof. Paul Erdős said that "Mathematics is not ready for such problems" and offered 500 USD for its solution.

For several years, Schogt's manuscript was not accepted for publication. It was only after Andrew Wiles published his proof of Fermat's last theorem in 1995 that mathematics became sexy again and *De wilde getallen* was finally published in 1998, an English version came out in 2000, and later appeared German and Italian translations. In fact the first idea of Schogt was to let Swift solve Fermat's problem, but fortunately his friend talked him out of that because 'the mathematics there are so involved that it would be most unrealistic that a mediocre mathematician would solve the problem'.

Although the wild number sequence makes no sense, it nevertheless got a mention in the *Online Encyclopedia of Integer Sequences*[1] founded by N.J. Sloane. This may be partially because some mathematicians got interested and formulated specific transformations to generate sequences of pseudo wild numbers which can also be found in the OEIS. These do generate genuine number theoretic problems.

A. Bultheel

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[1] entry A058883 at `http://oeis.org/`
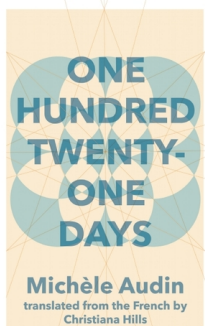
Michèle Audin is a mathematician working in the field of symplectic geometry at IRMA (l'Institut de recherche mathématique avancée) in Strasbourg. She is the author of several books on mathematics and mathematical history books. Since in 2013 she wrote a novel *Une vie brève* in which she tells the story of her father Maurice Audin (also a mathematician who, as an activist, was tortured and killed in 1957 by the French in the battle of Algeria) she has chosen a more literary career. She became since 2009 a member of Oulipo (**Ou**vroir de **li**ttérature **po**tentielle), a movement of writers and mathematicians who self-impose patterns and structures to produce their literature. For example Georges Perec wrote *La disparition* (1969), a book in which the letter e does not appear, or *Cent mille milliards de poèmes* (1961) by Raymond Queneau which allows the reader to combinatorially compose his or her poem.

In 2014 she wrote *Cent vingt et un jours*, her first true novel (that is only now translated into English). Since then she published also *Mademoiselle Haas* and *La formule de Stokes* both in 2016.

What are the 121 days about? It is about generations of mathematicians, their friends and relatives, several of them Jews, who live through the atrocities of two world wars.

If you wanted to write a biography about people who really have existed, you would probably start by collecting the appropriate documentation: letters, diaries, snippets from newspapers, history books, pictures, etc. Although this book is about fictional characters, Audin does exactly that: she 'invents' all these data about her protagonists and collects them in different chapters. The pictures are not included but she gives descriptions of what is to be seen on them. Once all the material is collected, that is where an author would normally start writing the story. But that is where Audin stops, since the reader has been given all the instruments and data available and hence this reader has already the complete story in his or her head. There is no point in telling it anymore. Every chapter is of a totally different type, one is a collection of newspaper clippings, another one has diary extracts, or portions from a psychiatric report, or an historian goes through his files and notes, or he describes a walk through Paris, etc. So there is a completely different style for every chapter which is Audin's oulipian constraint for this book. The book has a cyclic structure. The style of the first chapter is a fairy tale, and the first sentence "Once upon a time, in a remote region of a faraway land, there lived a little boy" is also the last one. Indeed when the historian has collected all his material, that is when he should start writing the book.

Since the reader is presented the raw material and has to construct the coherent story for herself, it is not always that easy to keep track of all the characters and the events. It might help to briefly sketch the situation.

The 'little boy' in the first chapter lives in Africa and is sent to Europe to study mathematics but he becomes wounded in the first WW so that he has to wear a black leather mask (an evil Darth Vader may come to your mind). His name is Christian Mortsauf (Audin uses many variations for this name or just abbreviates it to M.). The second chapter contains diary fragments of Marguerite Janvier, a nurse in a war hospital who is taking care of Christian and who will later become his wife. She also has to nurse Robert Gorenstein who has a head injury. In a third chapter journal clippings tell us among other things that Gorenstein shortly after the war murdered his family and is locked away in an asylum where he continues doing mathematics. Next is an interview in which Pierre Meyer tells about his brilliant classmate André Silberberg in Strasbourg who solved the important mathematical Gorenstein problem just before WWII. His result is presented by Mortsauf to the Académie. Silberberg is a young rebel and

himself being a Jew, revolts against the antisemitism of those days and collides with Heinrich Kürz, a Nazi mathematician. Kürz's journal notes of 1942 form the next chapter. We learn that his friend Mortsauf became a collaborator. Some photographs bring us through WWII and then comes the main chapter called 121 days in which the war ends and Mireille Duvivier, Gorenstein's niece, goes looking for her lover André Silberberg. Unfortunately he did not survive the Auschwitz death march like so many others. Three more chapters follow: one is an enumeration of numbers and their universal or mathematical meaning or more especially the meaning they get in the context of this story. We find pi, and Gorenstein's constant, or 28, a perfect number, or the imaginary part of the first zero of the zeta function, but also 7 kilometers, the distance between Monowitz and the main camp of Auschwitz and 67 kilometers, the length of the Auschwitz death march, or 31, the age at which André died in Mariahilf, 1926, the year that Vito Volterra invented the predator-prey systems, etc. Numbers coldly measure data and yet they can be heavily loaded emotionally. Next follows an inventory of the material and notes that are collected by 'the historian' in the period 2006-2010 who wants to write a biography of Mortsauf (but one of the heirs does no give permission to publish the letters), hence the material is left 'unused' as it is in this novel. In a walk through Paris, the historian leaves the cemetery of Montmartre where Pierre Meyer has just been buried (2013) and gives us a guided tour until he arrives at the Place du colonel-Rol-Tanguy. (This colonel and general Leclerc were the military that accepted the German surrender when Paris was liberated on 24 August 1944).

The last chapter is not numbered but is called a 'supernumeracy chapter'. Here Audin assures us that this is fiction and all resemblance with real persons, living or dead is purely coincidental. Then follows a long list of books where she found her inspiration, the books that

Rol-Tanguy and Leclerc (1944)

have been mentioned or cited, and all the geographic places that were mentioned at some point. Finally there is a long name-index of all the fictitious and real persons that were used.
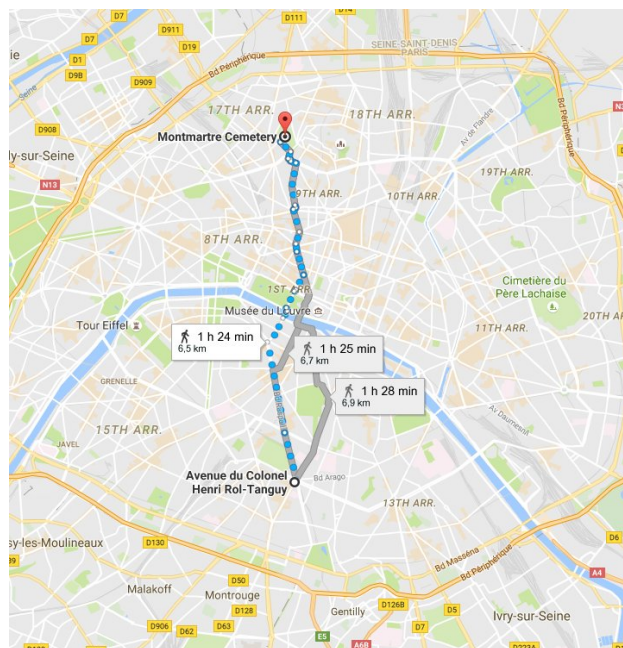
The climax of the novel lies in the '121 days' chapter. It refers to the period when Mireille has first seen André Silberberg (23 February 1943) till when André was arrested as a member of the Resistance (24 June 1943), 121 days of love and happiness. Audin shows how history is born. She starts from the original facts told by people who experienced and lived through the facts. Facts that leave their echoes in newspapers, letters, diaries, and medical reports. These are picked up later by historians who are hindered by limited resources, misinterpretations, and manipulations. Does Audin suggest that love is the true material that survives all the atrocities of war, even if there is not always a happy ending. Perhaps, not the facts and numbers is what should be remembered but the sentiments of people. The number 121 surmounts the 120 days of de Sade's Sodom. 121 is the square of 11, and 11 is is the juxtaposition of two individual units, two people forming an indivisible prime number. Would that be a message?

So there is no mathematics in this book (except for the 'numbers') or is there? But the central characters are mathematicians, probably because that is the world that Audin knows best.

Adhemar Bultheel

Did you know that (if you read this on March 14) ...

- ... today is π-day?
  Why? Because in America they write 3/14 for the date of today, March 14, and 3.14 is an approximation to the number π.
  Today you should eat pie, as everyone does. Or you should buy some pie for someone!

- ... the number π is a mathematical constant that (still) is the ratio between the circumference of a circle and its diameter? The first 500 decimal digits of π are given by:

  3.14159265358979323846264338327950
  288419716939937510582097494459230781
  640628620899862803482534211706798214
  808651328230664709384460955058223172
  535940812848111745028410270193852110
  555964462294895493038196442881097566
  593344612847564823378678316527120190
  914564856692346034861045432664821339
  360726024914127372458700660631558817
  488152092096282925409171536436789259
  036001133053054882046652138414695194
  151160943305727036575959195309218611
  738193261179310511854807446237996274
  956735188575272489122793818301194913

- ... there's a new π-record? Peter Trüb calculated π to π^e trillion decimal digits. This means 22,459,157,718,361 digits. The calculation started on July 29 and ended November 11, 2016. He used the series for π that was found by the Chudnovsky brothers:

  $$\frac{1}{12\pi} = \sum_{k=0}^{\infty} \frac{545140134k + 13591409}{640320^{3k+3/2}} \frac{(-1)^k(6k)!}{(3k)!k!^3}.$$

  The result was checked using Bellard's formula:

  $$\pi = \frac{1}{2^6} \sum_{n=0}^{\infty} \frac{(-1)^n}{2^{10n}} \left(-\frac{2^5}{4n+1} - \frac{1}{4n+3} \right.$$

  $$+ \frac{2^8}{10n+1} - \frac{2^6}{10n+3} - \frac{2^2}{10n+5}$$

  $$\left. - \frac{2^2}{10n+7} + \frac{1}{10n+9} \right).$$

  With this series it is possible to calculate some hexadecimal digit of π without calculating all the previous ones. The calculation was first done hexadecimally, and then converted. The last few decimal digits in the result are: 237. More about this can be found here: http://pi2e.ch/blog/.

- ... the great philosopher and mathematician Gottfried Wilhelm Leibniz (1646-1716) had something with π? In one of his papers we found the following drawing:
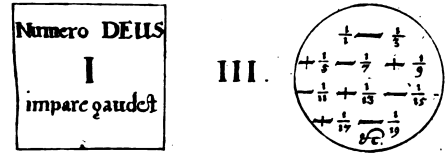

  which looks a bit like a representation of the squaring of the circle. In the circle you see the well known series for π that is sometimes attributed to Leibniz:

  $$\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \dots$$

  This series contains only odd numbers, and that explains the Latin quote from Virgil in the square on the left: God loves odd numbers.

- ... Leibniz wasn't the only 'circle-squaring' great mathematician? Srinivasa Ramanujan (1887-1920) was another one. Here's a drawing of his method:
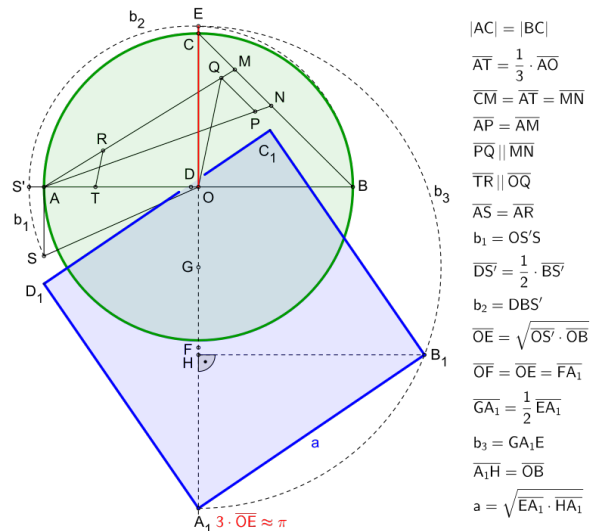
  which gives an approximation to π correct to 8 decimal places!
  Ramanujan clearly loved the number π. You should see the recent movie *The man who knew infinity* if you want to know more about him. The first letter he wrote to G. Hardy in 1913 was accompanied by a number of pages of formulas. This is one of them:

(3) $1 - 5 \cdot \left(\frac{1}{2}\right)^3 + 9 \cdot \left(\frac{1 \cdot 3}{2 \cdot 4}\right)^3 - \&c = \frac{2}{\pi}.$

with sum $2/\pi$. At that time there weren't a lot of series known with a sum with π in the denominator. Here's another one from his paper from 1914:

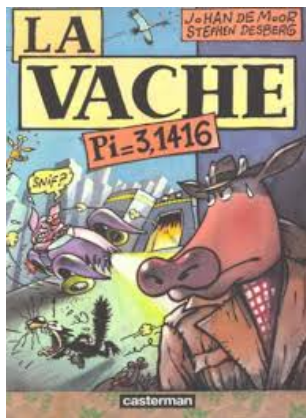$$\sum_{n=0}^{\infty} \frac{(42n+5)\binom{2n}{n}^3}{2^{12n}} = \frac{16}{\pi}.$$

This is a very nice series which converges very swiftly.

- ... artists can be inspired by the number π? This is a work by Philippe Boutibonnes (1938−), his Récit de Pi (2000): 60000 digits of π written out by hand in Japanese folding books.
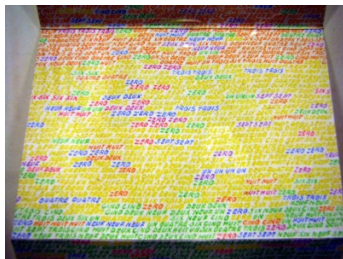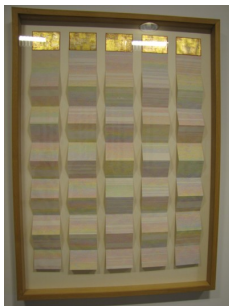
There's a detail at the right.

- ... there is a comic book with title Pi=3,1416? It's the name of the secret agent cow starring in the book.

- ... π appears in several episodes of the Simpsons? In one of them John Nerdelbaum Frink Jr., Springfields favorite absentminded professor, has to introduce Lisa Simpson who is going to give a talk. To silence the audience he calls out: "Scientist ... Scientists, please! I'm looking for some order. Some order, please, with the eyes forward ... and the hands neatly folded ... and the paying of attention ... Pi is exactly three!


- ... this can be seen in one of the episodes of the series Futurama?

- ... one of the buildings of the Google Corporation at Mountain View, Santa Clara County, California, United States is called Pi?

- ... if you tie a rope tightly around the Earth's equator, and you add 1 meter to its length, that if the rope is raised up uniformly all around the Earth as high as is possible to make it tight again (figure a), it's height above the ground will be $\frac{100}{2\pi} = 15.9$ cm? This is a very old problem that can be traced back to 1702.
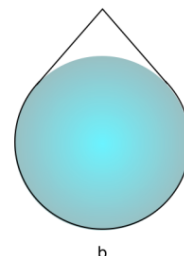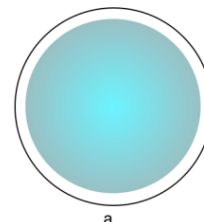
And how high above the ground is the highest point (for the same rope) in figure b? (Answer: 121.37 m)

- ... the world record reciting digits of pi while juggling with three balls stands at 9778 digits (1 hour 20 minutes 45 seconds)?

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