BELGIAN MATHEMATICAL SOCIETY

Comité National de Mathématique CNM

C W N M

NCW Nationaal Comite voor Wiskunde

BMS-NCM NEWS: the Newsletter of the Belgian Mathematical Society and the National Committee for Mathematics

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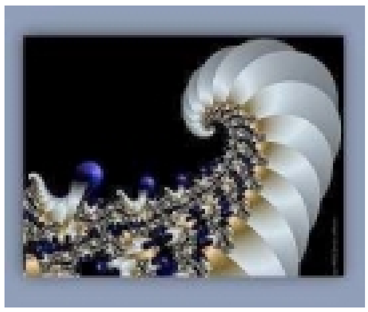

BMS-NCM NEWS

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No 43, May 15, 2003

1 News from the BMS

The next meeting of the Executive Committee is scheduled on May 17, 2003.

2 Meetings, seminars, conferences

2.1 May 2003

GROUPE DE CONTACT FNRS
Théorie des modèles et corps valués.
15 mai 2003, Université Libre de Bruxelles

- 10h45-11h10 Coffee
- 11h15-12h25 HASKELL D. (McMaster C., Paris 7)
  Imaginaries in algebraically closed valued fields (part 1)
- 12h30-13h30 Lunch
- 13h30-14h40 MACPHERSON D. (Leeds, U.K.)
  Imaginaries in algebraically closed valued fields (part 2)
- 14h45-15h55 CLUCKERS R. (Leuven, B.)
  P-adic integration and exponential sums
- 16h00-16h30 Coffee break
- 16h30-17h40 BELAIR L. (UQAM,C., Paris 7, F.) to be announced
- 19h00 Diner en ville.

Si vous désirez participer à cette réunion et prendre part au repas, faites-le savoir (si possible par email) à **Christian Michaux (christian.michaux@umh.ac.be)**

Functional Analysis
UMH, Monday May 26, 2003

- P. LEFEVRE
  Sous-espaces riches de fonctions continues
- F. BAYART
  Propriétés de géométrie analytique de l'anneau des séries de Dirichlet convergentes
- M. DUTRIEUX
  Title to be announced

2.2 June 2003

Functional Analysis and Partial Differential Equations
Han-sur-Lesse, June 2–3, 2003, Domaine des Masures

The next meeting is organized at the "Domaine des Masures" in Han-sur-Lesse. It will start on Monday June 2nd around 14:00 and will end on Tuesday June 3rd in the early afternoon.

The following speakers are expected:

- J. Elschner (WIAS Berlin)
  Inverse problems for periodical diffractive structures

- F. Martinez Gimenez (Politechnical University of Valencia)
  Hypercyclic and chaotic polynomials on Fréchet spaces
- C. Michels (University of Oldenburg)
  Summing operators, singular numbers and eigenvalues
- S. Nicolay (University of Liège)
  Discretizing fractional Brownian motion
- P. Paúl (University of Sevilla)
  Quasi-similarity of Hilbert space operators
- E. Schrohe (University of Potsdam)
  Powers of the Laplacian and Hadamard states on conformally compact spaces
- V. Thilliez (University of Lille)
  On the Borel-Ritt theorem for ultradifferentiable classes

If you intend to participate in the meeting, please ask for a registration form to one of the organizers. Due to the limited number of possible participants (around 30 to 35), we might have to cancel some registrations. The choice will be made according to the rule "first claimed, first served". A letter dated early May will let you know about this.

F. Bastin: `F.Bastin@ulg.ac.be`
J. Schmets: `J.Schmets@ulg.ac.be`
J.-P. Schneiders `jpschneiders@ulg.ac.be`

Université de Liège / Institut de Mathématique
Grande Traverse, 12 / Sart Tilman Bât. B 37
B-4000 Liège 1 / Belgium.

Computational methods in the biomolecular sciences
Friday 6 June 2003, 14h00 till 18h00
Place: Celestijnenlaan 200 D, 05.11

URL: http://www.chem.kuleuven.ac.be
Contactperson: Karin Snel, Tel. 016 327142 (karin.snel@fys.kuleuven.ac.be)

Eurographics symposium on rendering
25-27 June 2003, Leuven

The symposium is organized in the context of the Eurographics Working Group on Rendering Activities. The program co-chairs are Per Christensen and Daniel Cohen-Or. The local organizers are Philip Dutre, Frank Suykens, and other members of the Computer Graphics Group at Katolieke Universiteit Leuven.

Information on the website `http://www.egsr2003.org/`

2.3 July 2003

Equadiff 2003
International Conference on Differential Equations
Hasselt-Belgium, July 22-26,2003

Equadiff 2003, International Conference on Differential Equations, Hasselt (Belgium), July 22-26, 2003.

Organizing committee:
F. Dumortier (Chair), H.W. Broer, J.P. Gossez, J. Mawhin, A. Vanderbauwhede, S. Verduyn Lunel

Scientific committee:
A. Ambrosetti, A. Doelman, E. Feireisl, B. Fiedler, M. Fila, J. Hale, Y. Ilyashenko, J. Palis, B. Peletier, C. Simo, F. Takens

Invited speakers and organizers of mini-symposia include:
A. Albouy, V. Araujo, P. Bonckaert, R. Farwig, M. Golubitsky, H. Hanbmann, A.J. Homburg, R. Johnson, H. Th. Jongen, V. Kaloshin, T. Kaper, A. Katok, H. Kokubu, B. Krauskopf, P. Krejci, K. Lust, R. MacKay, J. Mallet-Paret, H. Matano, A. Mielke, R. Moeckel, R. Obaya, R. Ortega, R. Peeters, P. Polcik, D. Rand, G. Raugel, M. Roberts, R. Roussarie, B. Sandstede, K. Schmitt, G. Sell, D. Serre, J. Sotomayor, C. Stuart, P. Szmolyan, S. Terracini, J.F. Toland, F. Verhulst, M. Viana, O.J. Vrieze, M. Wiegner, Y. Yi, K. Zumbrun

Information and registration: `http://www.equadiff.be` or by e-mail `equadiff@luc.ac.be`

2.4 September 2003

International Workshop
Finitely presented algebras, groups and monoids
September 1–5, 2003, Alden Biesen (www.alden-biesen.be), Belgium, 2-nd announcement

ORGANIZERS

Eric Jespers	Jan Okninski
Department of Mathematics	Institute of Mathematics
Vrije Universiteit Brussel	University of Warsaw
Pleinlaan 2, 1050 Brussel	Banacha 2, 02-097 Warsaw
Belgium	Poland
efjesper@vub.ac.be	okninski@mimuw.edu.pl
tel.: +32-26293493	

INVITED MAIN SPEAKERS

- Professor P. Dehornoy, Univ. Caen, France
- Professor V. Ufnarovskii, Univ. Lund, Sweden
- Professor M. Van den Bergh, Limburgs Univ. Centrum, Diepenbeek, Belgium

PARTICIPANTS
So far the following mathematicians have shown interest to participate in the workshop:

V. Bavula (Sheffield, UK), K. Brown (Glasgow, Scotland), F. Cedo (Barcelona, Spain), T. Gateva-Ivanova (Sofia, Bulgaria), J. Gomez Torrecillas (Granada, Spain), D. Jordan (Sheffield, UK), T. Lenagan (Edinburgh, UK), A. Leroy (Lens, France), S. Pride (Glasgow, Scotland), D. Riley (London, Canada), A. del Rio (Murcia, Spain), N. Ruskuc (St.Andrews, UK),

J. Jaszunska (Warsaw, Poland), J. Krempa (Warsaw, Poland), Z. Marciniak (Warsaw, Poland), J. Matczuk (Warsaw, Poland), J. Okninski (Warsaw, Poland), E. Puczylowski (Warsaw, Poland), A. Salwa (Warsaw, Poland), A. Strojnowski (Warsaw, Poland), A. Szczepanski (Gdansk, Poland),

K. Dekimpe (Kortrijk, Belgium), A. Descheemaeker (Kortrijk, Belgium), P. Igodt (Kortrijk, Belgium), W. Malfait (Kortrijk, Belgium),

S. Caenepeel (Brussels, Belgium), P. Cara (Brussels, Belgium), A. Dooms (Brussels, Belgium), E. Jespers (Brussels, Belgium), P. Wauters (Diepenbeek, Belgium).

AIM
This conference is within the framework of the bilateral agreement between the universities Vrije Universiteit Brussel VUB , Katholieke Universiteit Leuven KULAK and Warsaw University. It is sponsored by the Ministry of the Flemish Government.

The central theme of the meeting is on "finitely presented algebras, groups and monoids". We will focus on special classes of finitely presented monoids related to important classes of groups and algebras, applications of Gröbner bases and computational algebra methods, and concrete non-commutative classes of finitely presented algebras. In particular, we are interested in the impact of the type of the presentation on the structural properties, such as dimensions, finiteness conditions and identities.

The meeting brings together specialists from Poland and Flanders, but also experts from other countries who have approached such problems from different points of view.

TALK

The main speakers will present two one-hour talks. Other participants that are interested in presenting a short talk (30 minutes) are asked to submit a title and an abstract within the next three months.

PRACTICAL INFORMATION

This will be provided at a later stage.

Cellular Automata 2003: Workshop on all aspects of Cellular Automata
8-10 September 2003, Leuven

9th IFIP (International Federation for Information Processing, Working group 1.5) Workshop on all aspects of Cellular Automata.

Place: Departement Elektrotechniek, Kasteelpark Arenberg 10, Heverlee

Contactperson: Andr Barb, Tel. 016 32 10 53, Fax 016 32 19 70 (andre.barba@esat.kuleuven.ac.be)

Organisation: Departement Elektrotechniek ESAT, Afdeling SCD/Sista

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First Announcement
EMS Mathematical weekend in Lisbon

September 12 - 14, 2003, Lisbon, Portugal

This meeting is jointly organized by the European Mathematical Society and by the Portuguese Mathematical Society.

PROGRAM

There will be five Special Sessions and one-hour Plenary Lectures given by the following speakers:

- Michele Audin (Strasbourg)
- Jean-Michel Bismut (Orsay)
- Bernard Dacorogna (Lausanne)
- Hans Foelmer (Berlin)
- Gilles Lebeau (Nice)

The meeting will start on Friday, September 12, at noon, and finish on Sunday, September 14, early afternoon.

SPECIAL SESSIONS

Session on Symplectic and Related Geometries Organized by Michele Audin

Confirmed Speakers: S. Anjos (Lisbon), V. Colin (Nantes), O. Garcia-Prada (Madrid), E. Giroux (Lyon), E. Prato (Nice), F. Presas (Stanford), S. Racaniere (London).

Session on Analysis and Geometry Organized by Jean-Michel Bismut

Confirmed Speakers: A. Alekseev (Geneve), F. Barthe (Marne-la Vallee), S. Bauer (Bielefeld), D. Gaboriau (Lyon), S. Goette (Tubingen), R. Kenyon (Orsay), F. Labourie (Orsay), K. Monhke (Berlin), P. Piazza (Rome I), L. Polterovitch (Tel-Aviv), D. Salamon (Zurich), A. Szenes (Budapest).

Session on Calculus of Variations Organized by Bernard Dacorogna

Confirmed Speakers: G. Friesecke (Warwick), N. Fusco (Napoli), B. Kirchheim (Leipzig), J. Kristensen (Heriot-Watt), P. Marcellini (Firenze), P. Marechal (Montpellier), L. Mascarenhas (Lisbon), J. Matias (Lisbon), G. Mingione (Parma), F. Murat (Paris).

Session on Stochastic Analysis and Mathematical Finance

Organized by Hans Foelmer

Confirmed Speakers: P. Bank (Berlin), N. El Karoui (Paris), M. Fritelli (Florence), M. Jeanblanc (Paris), Y. Kabanov (Besancon), B. Oksendal (Oslo), T. Rheinlaender (Zurich), C. Rogers (Cambridge), W. Schachermayer (Vienna), J. Teichmann (Vienna).

Session on Non-linear Evolution Equations Organized by Gilles Lebeau

Confirmed Speakers: S. Alinhac (Orsay), J.-M. Delort (Paris-Nord), J. P. Dias (Lisbon), E. Grenier (Lyon), S. Klainerman (Princeton), F. Merle (Cergy-Pointoise), B. Perthame (ENS-Paris), D. Piero (Roma), M. Struwe (Zurich), G. Velo (Bologna).

FURTHER INFORMATION

For more or updated information, please see our web page:

http://www.math.ist.utl.pt/ems/

Please send your questions or comments to any of the local organizers.

ORGANIZING COMMITTEE

- Ana Bela Cruzeiro (Session on Stochastic Analysis) email: abcruz@math.ist.utl.pt
- Ana Cannas da Silva (Session on Symplectic and Related Geometries) email: acannas@math.ist.utl.pt
- Pedro Freitas (Session on Non-linear Evolution Equations) email: pfreitas@math.ist.utl.pt
- Rui Loja Fernandes (Session on Analysis and Geometry) email: rfern@math.ist.utl.pt
- Jose Matias (Session on Calculus of Variations) email: jmatias@math.ist.utl.pt

2.5 October 2003

Study Day on Mathematics and Genomics
October 18, 2003
Paleis der Academiën, Hertogsstraat 1, 1000 Brussel

Organization: Belgian Mathematical Society, National Committee of Mathematics, Scientific Research Network Advanced Numerical Methods for Mathematical Modeling

See the pages `http://www.cs.kuleuven.ac.be/~ade/WWW/WOG/genomics/`.

2.6 2003-2004

To have the list of the workshops to be held at *Research Institute for Mathematical Sciences Kyoto University* for the period April 2003, March 2004, please see the pages

http://www.kurims.kyoto-u.ac.jp/workshop-e.html

3 Summary of PhD theses

Department of Mathematical Physics and Astronomy
Faculty of Sciences, Ghent University
Krijgslaan 281, S9, 9000 Gent

Generalised Connections and Applications to Control Theory
B. Langerock
Supervisor: Prof. Dr. F. Cantrijn, Ghent University
Defence: April 23, 2003

In this thesis, a new geometric framework is presented for treating some problems in geometric control theory, sub-Riemannian geometry and the Lagrangian approach to dynamical systems with nonholonomic constraints.

The general setting is that of generalised connections on “anchored bundles”, the theory of which is developed as an extension of the theory of connections on Lie algebroids. As a first application of this general approach to connections, a proof is given of a coordinate free version of the Maximum Principle in optimal control theory. As a side result, necessary and sufficient conditions are established for the existence of so-called abnormal extremals for an optimal control system. Next, the new formalism is also applied to study the role of generalised connections in the framework of sub-Riemannian geometry, leading, among others, to a new characterisation of normal and abnormal extremals of a sub-Riemannian structure. Finally, it is shown that the theory of generalised connections on anchored bundles also offers a natural setting for treating dynamical systems with nonholonomic constraints, both from the mechanical point of view (i.e. nonholonomic mechanics) and from the variational point of view (i.e "vakonomic" dynamics).

4 Mathematical Olympiad

4.1 Solutions to the problems of the previous Newsletter

35th IMO (1994, Hong Kong), question 1.
Let m and n be positive integers. Let $a_1, a_2, \ldots, a_m$ be distinct elements of $\{1, 2, \ldots, n\}$ such that whenever $a_i + a_j \leq n$ for some i, j, $1 \leq i \leq j \leq m$, there exists k, $1 \leq k \leq m$, with $a_i + a_j = a_k$. Prove that

$$\frac{a_1 + a_2 + \cdots + a_m}{m} \geq \frac{n+1}{2}.$$

Solution. On peut évidemment supposer que la suite des a_i est (strictement) croissante.

Il suffit alors de prouver que pour tout i (tel que $1 \leq i \leq m$), nous avons

$$a_i + a_{m+1-i} \geq n + 1.$$

Puisque les nombres considérés sont entiers, cela revient à prouver que

$$a_i + a_{m+1-i} > n$$

pour tout i tel que $1 \leq i \leq m$.

Supposons que, par l'absurde, il existe un i tel que $1 \leq i \leq m$ et

$$a_i + a_{m+1-i} \leq n.$$

Alors, pour tout j tel que $1 \leq j \leq i$, nous avons (puisque la suite des a_i est croissante, d'où $a_j \leq a_i$)

$$a_j + a_{m+1-i} \leq n.$$

D'après les hypothèses de l'énoncé, il existe donc pour chacun des j tels que $1 \leq j \leq i$, un indice $k(j)$ (dépendant de i, mais i peut rester implicite dans la notation) tel que

$$a_j + a_{m+1-i} = a_{k(j)}. \tag{1}$$

Puisque, d'après les hypothèses de l'énoncé, $0 < a_j$, ceci entraîne

$$a_{m+1-i} < a_{k(j)},$$

d'où, puisque nous supposons la suite des a_i croissante,

$$k(j) > m + 1 - i,$$

donc $k(j)$ est un des nombres $m+2-i, m+3-i, \ldots, m$, lesquels sont en quantité $i-1$. Comme les j considérés sont en quantité i, il y en a donc au moins deux auxquels correspond le même $k(j)$. Mais notre relation (1) montre que a_j est déterminé par $k(j)$, ce qui entraîne, puisque les nombres $a_1, \ldots, a_m$ sont deux à deux distincts, que j lui-même est déterminé par $k(j)$. La contradiction obtenue prouve la thèse.

34th IMO (1993, Istambul), question 3.
On an infinite chessboard, a game is played as follows. At th start, n^2 pieces are arranged on the chessboard in an n by n block of adjoining squares, one piece in each square. A move in the game is a jump in a horizontal or vertical direction over an adjacent occupied square to an unoccupied square immediately beyond. The piece which has been jumped over is removed. Find those values of n for which the game can end with only one piece remaining on the board.

Solution. Soit n le nombre de lignes (et de colonnes) du carré de départ. Prouvons que

si n est divisible par 3, il n'y a pas de solution. (2)

Nous pouvons supposer que les cases de l'échiquier sont de 3 couleurs, avec la disposition noir, jaune, rouge, noir, jaune, rouge etc. de gauche à droite et de bas en haut. (Cela revient à considérer, pour chaque case, le reste par 3 de la somme abscisse + ordonnée de cette case, mais le langage des couleurs simplifie les expressions.) Chaque coup libère deux cases de couleurs différentes et rend occupée une case de la troisième couleur. Puisque nous supposons n divisible par 3, il est clair qu'au départ, un même nombre de cases de chaque couleur est occupé. Nous allons démontrer le résultat suivant, plus fort que notre thèse (2) :

> si on part d'une figure (carrée ou non) telle qu'un même nombre de cases de chaque couleur soit occupé, le problème n'a pas de solution. (3)

Soit k le nombre de cases occupées de chaque couleur. Supposons que, par l'absurde, il y ait une solution. Soit a le nombre de coups qui libèrent une case noire et une case jaune (et rendent occupée une case rouge); soit b le nombre de coups qui libèrent une case jaune et une case rouge (et rendent occupée une case noire); soit c le nombre de coups qui libèrent une case rouge et une case noire (et rendent occupée une case jaune). Le nombre de cases noires restant occupées à la fin du jeu est donc

$$k - a - c + b; \tag{4}$$

le nombre de cases jaunes restant occupées est

$$k - a - b + c; \tag{5}$$

le nombre de cases rouges restant occupées est

$$k - b - c + a. \tag{6}$$

Puisqu'on suppose le jeu gagnant, un de ces nombres est égal à 1 et les deux autres à 0. Si par exemple les deux premiers nombres sont nuls, ils sont égaux entre eux, d'où $b = c$, d'où $a = k$. L'égalité du nombre (6) à 1 s'écrit alors $2k - 2b = 1$, ce qui est impossible puisque les deux membres ne sont pas de même parité. Cette contradiction prouve la thèse (3) et donc aussi la thèse moins forte (2).

Il n'y a donc pas de solution pour un carré à n lignes et n colonnes si n est divisible par 3. Prouvons qu'il y a une solution si n n'est pas divisible par 3. Pour $n = 1$, c'est immédiat. Pour $n = 2$, on peut par exemple sauter horizontalement au-dessus des deux pièces de la seconde colonne et terminer par un saut vertical. Soit $n \geq 4$. Avant de raisonner par récurrence, notons que si trois pièces forment une suite contiguë horizontale ou verticale et qu'une au moins des pièces extrêmes de cette suite est bordée, transversalement à cette suite, par une case occupée et par une case vide, on peut supprimer les trois pièces en question en laissant le reste en l'état. (Sauter au-dessus de l'extrémité en question, transversalement à la suite. Faire sauter l'autre pièce extrême de la suite au-dessus de la pièce médiane de la suite. Refaire le saut transversal en sens inverse.) En particulier, on peut toujours supprimer 3 pièces formant une suite contiguë horizontale ou verticale si cette suite est bordée d'un côté par 3 cases occupées et de l'autre côté par 3 cases vides.

Cela noté, si n est congru à 1 modulo 3, soit $n = 3r + 1$, nous pouvons supprimer les $3r$ pièces gauches de la ligne supérieure, puis les $3r$ pièces supérieures de la colonne droite, puis les $3r$ pièces droites de la ligne inférieure, puis les $3r$ pièces inférieures de la première colonne.

Il reste un carré de $n - 2$ lignes et $n - 2$ colonnes.

Si maintenant n est congru à 2 modulo 3, soit $n = 3r + 2$, nous pouvons, comme dans le cas précédent, supprimer les $3r$ pièces gauches de la ligne supérieure, puis les $3r$ pièces supérieures de la colonne droite, puis les $3r$ pièces droites de la ligne inférieure, puis les $3r$ pièces inférieures de la colonne gauche. Supprimons les $3r$ pièces gauches de ce qui reste de la seconde ligne, puis les $3r$ pièces supérieures de ce qui reste de la $(3r + 1)$ - ième colonne, puis les $3r$ pièces droites de ce qui reste de la $(3r + 1)$ - ième ligne, puis les $3r$ pièces inférieures de ce qui reste de la seconde colonne. Il reste un carré de $n - 4$ lignes et $n - 4$ colonnes. Dans les deux cas (n congru à 1 ou à 2 modulo 3), on s'est ramené à un carré plus petit dont le nombre de lignes et de colonnes n'est pas divisible par 3. Cela fournit une preuve par récurrence de l'existence d'une solution pour n non divisible par 3.

Adrien Delcour

4.2 Remarks on the solutions

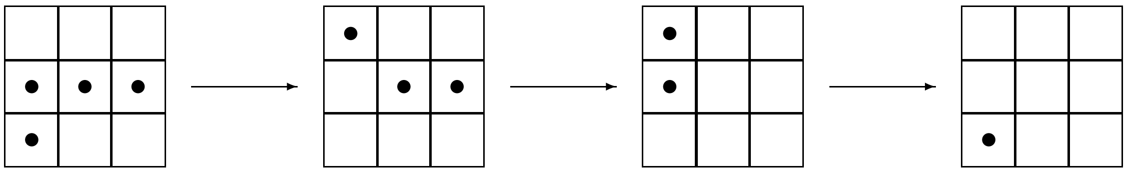
Les solutions aux deux problèmes sont correctes, à un infime détail près pour la seconde (voir ci-dessous). Aucun commentaire à propos de la solution du premier problème.

Concernant la solution du deuxième, deux petites remarques. Tout d'abord, une variante dans la preuve de (3) : l'argument de parité peut être exploité directement. Soient n, j et r les restes modulo 2 des nombres de pions qui se trouvent sur des cases noires, jaunes et rouges respectivement. Au départ, on a

$$n = j = r,$$

et à l'arrivée on souhaiterait une situation gagnante, pour laquelle une des trois valeurs vaut 1 et les deux autres sont nulles. Or, chaque mouvement sur l'échiquier inverse la parité des trois valeurs n, j et r, ce qui signifie que le triplet (n, j, r) est condamné à ne prendre que les valeurs (0, 0, 0) ou (1, 1, 1).

Enfin, considérons la manoeuvre qui permet de réduire la taille du carré dans la seconde partie de la preuve. Elle s'illustre comme suit



Elle permet effectivement de supprimer 3 pièces formant une suite contiguë horizontale ou verticale (horizontale dans notre exemple). Cependant, s'il est effectivement nécessaire que cette suite soit bordée d'un côté par trois cases vides (ici, les trois cases du dessus), il suffit que l'autre côté comporte un pion à une de ses extrémités au moins (ici, l'extrémité gauche). Il n'est pas nécessaire que cet autre côté comporte trois pions. Cette remarque a son importance, car les constructions proposées dans la preuve à l'aide de cette "manoeuvre" pour diminuer la taille du tableau seraient inapplicables si trois pions étaient requis.

A titre indicatif, nous donnons une autre construction, qui repose sur la même manoeuvre, permettant de diminuer de 3 la taille du carré de départ. Soit n un naturel strictement supérieur à 3. On supprime les 3 pièces droites de la n-ème ligne, les 3 pièces droites de la $n-1$-ème ligne, ... , les 3 pièces droites de la 4-ème ligne. Puis les 3 pièces supérieures de la n-ème colonne, les 3 pièces supérieures de la $n-1$-ème colonne, ... , les 3 pièces supérieures de la 4-ème colonne. Finalement, on supprime les 3 pièces gauches de la première ligne, de la deuxième, et enfin de la troisième.

Philippe Niederkorn
co-leader de l'équipe belge à l'OMI 2003

4.3 New problems

39th IMO (1998, Taipei), question 4.

Determine all pairs (a, b) of positive integers such that $ab^2 + b + 7$ divides $a^2b + a + b$.

38th IMO (1997, Mar del Plata), question 2.

Angle A is the smallest in the triangle ABC. The points B and C divide the circumcircle of the triangle into two arcs. Let U be an interior point of the arc between B and C which does not contain A. The perpendicular bisectors of AB and AC meet the line AU at V and W, respectively. The lines BV and CW meet at T. Show that

$$|AU| = |TB| + |TC|.$$

Philippe Niederkorn
co-leader de l'équipe belge à l'OMI 2003

And now, we are waiting for your solutions ... Do not forget to send them to F.Bastin@ulg.ac.be for the next issue of our Newsletter, i. e. before September 8, 2003. Thanks!

5 Miscellaneous

News from the Norwegian Academy about the first award of the Abel Prize

The winner will be announced in Oslo on 3 April. A web site is being prepared[1], and full information about the Prize and the winner will be posted their on that day.

The Prize will be presented by the King of Norway in the University Aula in Oslo on 3 June at 14.00. A programme of events of which this is the centrepiece is being arranged for 2-4 June.

John Kingman
President, European Mathematical Society

Call for Nominations of Candidates for ten EMS Prizes

Principal Guidelines

Any European mathematician who has not reached his or her 35th birthday on 30 June, 2004, and who has not previously received the prize, is eligible for an EMS Prize at 4ECM. A total of 10 prizes will be awarded.

The maximum age may be increased by up to three years in the case of an individual with a corresponding "broken career pattern". Mathematicians are defined to be "European" if they are of European nationality or their normal place of work is within Europe. "Europe" is defined to be the union of any country part of which is geographically within Europe or that has a corporate member of the EMS based in that country.

Prizes are to be awarded for the best work published before the 31 December, 2003.

The Prize Committee shall interpret the word "best" using its judgement: e.g., it may refer to innate quality or impressiveness, influence, etc.

Nomination for the Award

The Prize Committee, headed by Professor Nina Uraltseva (St. Petersburg), is responsible for solicitation and evaluation of nominations. Nominations may be made by anyone, including members of the Prize Committee or by the candidates themselves. It is the responsibility of the nominator to provide all relevant information to the Prize Committee, including a rsum and documentation.

The nomination for the awards should be reported by the Prize Committee to the EMS President at least three months prior to the date of the awards. The nomination for each award must be accompanied by a written justification and a citation of about 100 words that can be read at the award ceremony.

The prizes cannot be shared.

Description of the Award

The award comprises a certificate including the citation and a cash prize of 5000 euro.

Award Presentation

The prizes will be presented at the Fourth European Congress of Mathematics by the President of the European Mathematical Society. The recipients will be invited to present their work at the conference.

Prize Fund

The money for the Prize Fund will be raised by the organizers of the Fourth European Congress of Mathematics in Stockholm.

Deadline for Submission

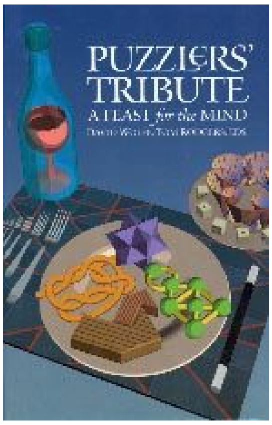
Nominations for the prize must reach the office in Stockholm at the following address no later than the 1 February, 2004:

4ECM Organizing Committee, Prof. Ari Laptev,
Department of Mathematics, Royal Institute of Technology, SE–100 44 Stockholm, Sweden.
E-mails: laptev@math.kth.se, uunur@nur.usr.pu.ru
http://www.math.kth.se/4ecm/
Fax: +46-8-723 17 88, Phone: +46-8-790 84 86

[1]The person in charge is Yngvar Reichelt of the Department of Mathematics at the University of Oslo ¡reichelt@math.uio.no

6 Fiction

David WOLFE and Tom RODGERS (Eds.). *Puzzlers' tribute. A feast for the mind*. Springer Monographs in Mathematics. A K Peters, Natick, MA (2002). xiv+420 pages. Hard cover, ISBN 1-56881121-7, EURO 43.00.



Admirors of Martin Gardner (for many years the author of the column *Mathematical Games* in Scientific American and the author of many books on recreational mathematics), have a *Gathering for Gardner* every 2 or 3 years. There have been 4 so far of these G4G's. *A Mathemagician and Pied Puzzler* (A K Peters, 1999) contained a first collection of contributions presented at these meetings; the present book is another one. Also the web site `http://www.g4g4.com` contains a lot of information. The contributions are about mathematics, magicians, puzzles, games, paradoxes, the calendar, poems, and many other bizarre and playfull things. It also contains a tribute to three of the deseased members: Harry Eng, David Klarner, and Mel Stover. Those who loved the books by Martin Gardner, will love this collection of tricks, brain teasers, game strategies, informative texts, etc.

Adhemar BULTHEEL

Sarah FLANNERY and David FLANNERY (Eds.). *In code: A Mathematical Journey*. Profile Books, London (2001). 269 pages. ISBN 1-86197-271-7.

In this number one bestseller the author Sarah Flannery tells us about how in 1999, at the age of 16, she won the Irish Young Scientist of the Year award with a public-key encryption algorithm she developed which is approximately 22 times faster than the RSA-algorithm.
Her story, which is interwoven with quite some mathematics (from magic squares to number theory and cryptography), is set in Blarney, near Cork, Ireland, where Sarah grew up and lives now with her family. Here her father David Flannery (coauthor of the book, and a mathematician) used to present puzzles to her and her four younger brothers on the blackboard in the kitchen, with the purpose of introducing his children to abstract reasoning. Sarah poses some of those puzzles to the reader and encourages him/her to solve them (solutions at the back). Some of these puzzles are classics, like the Two Jars Puzzle, and the "Von Neumann"-Train Problem.
In the second chapter of the book, entitled Mathematical Excursions, Sarah goes on telling us how she came to attend the lectures on popular, recreational mathematical themes given by her father at the Cork Institute of Technology, where he teaches. Some of these lectures were about number theory, and Sarah shares with the reader what she has learnt about prime numbers, factorisation, the Sieve of Eratosthenes, prime generating formulae, Mersenne primes, ...
At the same time Sarah enters her Transition year at her school (this is an optional year in the Irish secondary school system which comes at the end of the first three years and before the Senior cycle: the last two years). One of her teachers is looking for students to do a project for the Young Scientist Exhibition, an annual competition held in Dublin in January. Sarah volunteers, and after talking with her father about it, she gets started on her first project, which she entitles 'Cryptography - The Science of Secrecy'. For this project she programmed several (existing) encryption and decription algorithms (using Mathematica), while reading papers on the subject, provided by her father.
The next two chapters contain an introduction into Caesar and related cyphers, modular arithmetic, congruences, Fermat's little theorem, and some other mathematical topics.
In the fifth chapter some of the elements of cryptography are explained: one-way functions, trapdoor functions, public-key cryptography, and RSA.
In the sixth chapter, entitled 'Exhibition Time', Sarah picks up her story from chapter 2, and tells us how she wins the Intel Excellence Award with her project. Then, as part of her Transition year, she gets the opportunity to work for a week in a company, and Sarah chooses Baltimore Technologies, a Dublin-based cryptography company. Her work there consists of implementing an algorithm developed by one of the cryptologists at the firm, Michael Purser. She asks permission to modify the algorithm and presents it in its new form at the 1999 Young Scientist Exhibition. She calls the algorithm the 'Cayley-Purser' or CP-algorithm ('Cayley' because of the two-by-two matrices involved). In her project Sarah compares the speed of CP with that of RSA, and shows that the new algorithm is in fact 22 times faster than RSA. She wins the first prize at the Young Scientist Exhibition, and is elected to represent Ireland at the European Union Young Scientist Exhibition.
The final chapter is about all the media attention the family gets, about the flaw that was discovered in the algorithm and about Sarah winning the first prize at the European Young Scientist Exhibition in Thessaloniki

(Greece) in 1999.
In this UK-edition the book ends with four appendices: solutions to the puzzles from chapter 1, answers to questions posed in the text, an introduction to Euclid's algorithm and Euler's phi-function. But there is also a US-edition (Workman Publishing 2001, ISBN 0-7611-2384-9) with more mathematics and with the text of Sarah's winning project on the CP-algorithm as an appendix.
This delightful book contains an excellent introduction to number theory and cryptography suitable for people with not much of a mathematical background. The book reads wonderfully well, I enjoyed reading it a lot and would recommend it to everybody interested in mathematics.

Paul Levrie

7 The end ...

At a conference, a mathematician proves a theorem.

Someone in the audience interrupts him: "That proof must be wrong-I have a counterexample to your theorem."

The speaker replies: "I don't care-I have another proof for it."

A mathematician organizes a raffle in which the prize is an infinite amount of money paid over an infinite amount of time. Of course, with the promise of such a prize, his tickets sell like hot cakes.

When the winning ticket is drawn and the jubilant winner comes to claim his prize, the mathematicain explains the mode of payment: "1 dollar now, 1/2 dollar next week, 1/3 dollar the week after that ... "

Maths for blondes

After explaining to a student, with various lessons and examples, that:

$$\lim_{x\to 8} \frac{1}{x-8} = \infty$$

I tried to check if she really understood that, so I gave her a different example.

This was the result: