

BELGIAN MATHEMATICAL
SOCIETY

Comité National de Mathématique CNM

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NCW Nationaal Comité 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 64, September 15, 2007

Letter from the editor

Welcome

to this September 15, 2007- Issue of our Newsletter!

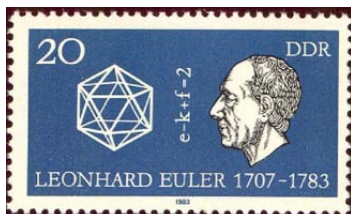
Regards, Françoise

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1 Euler's Gallery – Stamps and Money

Remember: April 15, 2007, was Euler's birthday! (300).



2 News from the BMS

2007 PhD-Day

Monday 10 September 2007 at the ULB

On September 10, the Belgian Mathematical Society organized its second **PhD-Day**. This second meeting had a great success. Thank you to each sponsor, participant and organizer; our next PhD-Day is going to take place in 2009.

The winners for the “best posters” are

1. *Mathieu Carette*, 50 EUR book voucher from EMS publishing house
2. *Pieter Tibboel*, two books about Leonhard Euler offered by Springer Verlag
3. *Joost Verduyck*, book “The Calculus Gallery” from Princeton University Press offered by Presses Universitaires de Bruxelles
4. *Mathieu Bogaerts*, book “Et Dieu créa les nombres” offered by Presses Universitaires de Bruxelles

You will find their posters at the end of this Newsletter (if you receive the paper version of the Newsletter) and on the web site of the society <http://bms.ulb.ac.be/phdday/winningposters07.php> (if you receive the electronic version of the Newsletter).

3 Meetings, Conferences, Lectures

3.1 September 2007

Non commutative rings and geometry

A conference in honour of Freddy Van Oystaeyen on the occasion of his 60th birthday

Almería, September 18-22, 2007

Organizing Committee: Stefaan Caenepeel (Brussels), Claudia Menini (Ferrara), Blas Torrecillas (Almería) and Alain Verschoren (Antwerp)

Local Committee: Maria Jesús Asensio, Justo Peralta and Luis Oyonarte

Invited speakers (tentative list): E. Enochs, I. Reiten, A. Joseph, J.L. Gomez Pardo, M. Van den Bergh, H. Schneider, S. Majid, A. Bondal, C. Năstăsescu, J. Alev, A. del Río, E. Jespers, D. Stefan, A. Melnikov, P. Jara, A. Szenes

The conference will take place in Almería, Spain, from September 18 until September 22, 2007. The arrival day is Monday, September 17. On Saturday afternoon there will be no lectures and we plan to organize a visit to the Natural Park of Cabo de Gata or some other nice countryside place and a conference dinner.

A very limited number of talks will be accepted.

A special issue of “Algebras and Representation Theory” will be dedicated to this meeting. Authors should submit their contributions in LaTeX to A. Verschoren, alain.verschoren@ua.ac.be. Submitted papers will be treated as ordinary submissions to the journal (see <http://www.springer.com>); authors will be notified about acceptance immediately after the refereeing process. Authors are invited to include a dedication like “Dedicated to Fred Van Oystaeyen, on the occasion of his sixtieth birthday”.

Registration for this event may be done through the web page www.ual.es/Congresos/fred/, where information about the city of Almería, the lodging offered by the organization and other related questions can be found.

3.2 October 2007

*Symposium: The birth of numerical analysis
Leuven, 29-30 October 2007*

Lecturers:

Gerard Alberts (Universiteit van Amsterdam, NL)
 Kendall E. Atkinson (Emeritus University of Iowa, USA)
 Claude Brezinski (Emeritus Université des Sciences et Technologies de Lille, FR)
 Philip J. Davis (Emeritus Brown University, USA)
 Jack Dongarra (University of Tennessee, USA)
 Brian Ford (Founder Director of Numerical Algorithms Group, UK)
 Rolf Jeltsch (ETH Zürich, CH)
 James Lyness (Argonne National Laboratory, USA, and Univ. New South Wales, AU)
 Robert J. Plemmons (Wake Forest University, USA)
 Michael J.D. Powell (University Cambridge, UK)
 Gerhard Wanner (Université de Genève, CH)
 G. Alistair Watson (University of Dundee, UK)

Registration and further details see

<http://www.cs.kuleuven.be/ade/WWW/WOG/history/>

3.3 2008

*Multiscale modeling an singular perturbations
Twente, January 8-11, 2008*

See the announcement at the end of the Newsletter.

*8th German Open Conference on Probability and Statistics:
Aachen, 4-7 March 2008*

Continuing the series of Conferences in Marburg 1993, Freiberg 1996, München 1998, Hamburg 2000, Magdeburg 2002, Karlsruhe 2004, and Frankfurt 2006, which have become the major events in probability and statistics in Germany, the DMV-Fachgruppe Stochastik jointly with the RWTH Aachen University organizes the 8th German Open Conference on Probability and Statistics ("Aachener Stochastik-Tage 2008").

In the tradition of the previous conferences, it provides an international forum for presentation and discussion of new results in the area of probability and statistics. Participants from universities, business, administration, and industry are welcome.

Sections:

Stochastic Analysis; Limit Theorems and Large Deviations; Stochastic Geometry, Spatial Statistics, and Image Analysis; Random Discrete Structures and Analysis of Algorithms; Stochastic Processes: Theory and Applications; Time Series and Statistics of Stochastic Processes; Curve Estimation; Asymptotic Statistics; Stochastic Optimization and Operations Research; Data Analysis and Multivariate Statistics; Stochastic Models in Finance and Insurance; Statistical Methods in Finance and Insurance; Econometrics and Risk Analysis; Stochastic Models in the Natural Sciences; Statistics in Medicine and Biosciences; Stochastic Methods in Engineering

Plenary speakers will be:

N. Balakrishnan (McMaster University, Canada), Steven N. Evans (University of California at Berkeley, USA), Frank den Hollander (Universiteit Leiden, The Netherlands), Eva Riccomagno (Politecnico di Torino, Italy), and Aad van der Vaart (Vrije Universiteit Amsterdam, The Netherlands)

For an announcement of the conference including more detailed information please visit the conference website <http://gocps2008.rwth-aachen.de>.

Contact information:

Email: gocps2008@stochastik.rwth-aachen.de

Programme committee:

Christine Müller (chair), Department of Mathematics, University of Kassel, D-34132 Kassel, Germany

Local organizing committee: Udo Kamps (chair), Institute of Statistics, RWTH Aachen University, D-52056 Aachen, Germany

***Fifth European Congress of Mathematics
Amsterdam, July 14-18, 2008***

Informations can be found at the address <http://www.5ecm.nl>

The Fifth European Congress of Mathematics (5ECM) will be organized in Amsterdam, from 14 - 18 July, 2008, under the auspices of the European Mathematical Society. This congress is the fifth in a series of successful four-yearly European congresses that cover the whole range of the mathematical sciences, from pure to applied. The series started in Budapest, in 1992, followed by meetings in Paris (1996), Barcelona (2000), and Stockholm (2004). The ECM congresses alternate with the IMU world congresses, organized every $(2 \bmod 4)$ year.

Next year's ECM congress will be organized under the special patronage of the Koninklijk Wiskundig Genootschap (Royal Dutch Mathematical Society, KWG), and will include the yearly meeting of the members of KWG. The 5ECM Local Organizing Committee consists of André Ran (Free University Amsterdam, chairman), Herman te Riele (CWI Amsterdam, secretary), and Jan Wiegerinck (University of Amsterdam, treasurer).

An outstanding Scientific Committee with representatives from all over Europe, chaired by Lex Schrijver (CWI and University of Amsterdam), has composed an interesting scientific program consisting of ten Plenary lectures, three (also plenary) Science lectures, about thirty (parallel) invited lectures, and twenty-one (parallel) Minisymposia. In addition, ten Prize lectures will be presented by outstanding young European mathematicians, selected by a Prize Committee chaired by Rob Tijdeman (Leiden University).

The ten ***Plenary lectures*** will be presented by

- Luigi Ambrosio (Scuola Normale Superiore di Pisa),
- Christine Bernardi (Université Paris VI),
- Jean Bourgain (IAS Princeton),
- Jean-François Le Gall (ENS & Université Paris VI),
- François Loeser (ENS Paris),
- László Lovász (Eötvös Loránd University, Budapest),
- Matilde Marcolli (Max Planck Institut Bonn),
- Felix Otto (Universität Bonn),
- Nicolai Reshetikhin (Univ. of California, Berkeley), and
- Richard Taylor (Harvard University, Cambridge)

and the three ***Science lectures*** by

- Ignacio Cirac (Max-Planck-Institut für Quantenoptik, Garching, Germany), on Quantum Information Theory,
- Tim Palmer (ECMWF Reading, UK), on Climate Change, and
- Jonathan Sherrat (Heriot-Watt University, Edinburgh, UK), on Mathematical Biology.

The ***topics and the organizers of the Minisymposia are:***

- Advances in Variational Evolution (Alexander Mielke, Ulisse Stefanelli)
- Algebra in Optimization (Jan Draisma, Monique Laurent)
- Applications of Noncommutative Geometry (Gunther Cornelissen, Klaas Landsman)
- Applied Algebraic Topology (Michael Farber)
- Combinatorics of Hard Problems (Josep Diaz, Oriol Serra, Jaroslav Nesetril)
- Coupled Cell Networks (Peter Ashwin, Ana Dias, Jeroen Lamb)
- Discrete Structures in Geometry and Topology (Dmitry Feichtner-Kozlov)
- Galois Theory and Explicit Methods (Bart de Smit)
- Global Attractors in Hyperbolic Hamiltonian Systems (Andrew Comech, Alexander Komech)
- Graphs and Matroids (Bert Gerards, Hein van der Holst, Rudi Pendavingh)
- Hypoellipticity, Analysis on Groups and Functional Inequalities (W. Hebisch, B. Zegarlinski)
- Mathematical Challenges in Cellular Systems (Frank Bruggeman, Mark Peletier)
- Mathematical Logic (Peter Koepke, Benedikt Löwe, Jaap van Oosten)
- Mathematical Finance (Hans Schumacher, Peter Spreij)
- Mathematics of Cryptology (Ronald Cramer)
- Representation Theoretical Methods and Quantization (Stefaan Caenepeel, Jürgen Fuchs, Alexander Stolin, Christoph Schweigert, Freddy van Oystaeyen)
- Rough Path Theory (Peter K. Friz)
- Singular Structures in Variational PDE's (Matthias Roeger, Mark Peletier)
- Spectral Problems and Hilbert Spaces of Entire Functions (Joaquim Bruna, Hakan Hedenmalm, Kristian Seip, Mikhail Sodin)
- Spectral Theory (E.B. Davies, T. Weidl, F. Klopp, T. Hoffmann-Ostenhof)
- Weak Approximations of Stochastic Differential Equations (Dan Crisan)

Special activities, organized by the KWG, are the Brouwer medal ceremony (an event organized every three years in memory of the Dutch mathematician L.E.J. Brouwer, consisting of a laudatio, a lecture and a medal presentation, followed by a reception), a historical lecture on Brouwer's life and work (by Dirk van Dalen), and the so-called Beeger lecture (an event organized every two years in memory of the Dutch high-school teacher and mathematician N.G.W.H. Beeger, with a talk on algorithmic and/or computational number theory). The names of the Brouwer and Beeger lecturers will be announced later.

For more information on the conference, such as grants, up-to-date information on the program, and for registration, please visit our website at www.5ecm.nl.

The organizers are proud that the EMS has selected Amsterdam to be the host city for its fifth congress, and we look forward to meeting you all next year in Amsterdam. Do not miss this opportunity to learn about the latest developments in mathematics, to meet old friends, and make new acquaintances, while enjoying a charming city with many 'do-not-miss-this' sights!

The 5ECM Local Organizing Committee

Last minute: On the website:

www.5ecm.nl

you will find the

Call for Registration and Abstracts

with all information about the congress known so far. It is possible to register now for this event. Please notice that members of the EMS and of the KWG pay a reduced fee. **Registration before April 1, 2008 further reduces the fee.**

4 Summary of PhD theses

An approach to non-abelian homology based on Categorical Galois Theory

Tomas Everaert

Promotor: prof. dr. R. Kieboom (Vrije Universiteit Brussel)
 Copromotor: prof. dr. M. Gran (Université du Littoral, Calais)

We geven in dit proefschrift een categorisch bewijs voor Hopf's klassieke formule voor de tweede homologie van een groep [2], in de context van semi-abelse categorieën [5]. De algemeenheid ervan levert niet alleen "Hopf-formules" in andere categorieën dan de variëteit van groepen, maar laat ook toe de "hogere Hopf-formules" van Brown en Ellis [1] af te leiden, eveneens in elke semi-abelse categorie. Hiertoe gebruiken we de categorische theorie van centrale extensies [4], een toepassing van de categorische Galois Theorie [3], en een hieruit afgeleide theorie van hogere centrale extensies, die we zelf ontwikkelen.

Verder tonen we het bestaan aan van een lange exacte homologierij die in de context van groepen een verlenging is van de Stallings-Stammbach rij [7, 8].

Centrale extensies geven aanleiding tot centralisatoren. We tonen dat, in variëteiten van Ω -groepen, dergelijke centralisatoren kunnen worden uitgebreid tot commutatoren. Op die manier verkrijgen we een notie van commutator gedefinieerd ten opzichte van een gekozen deelvariëteit. We tonen dat zowel de klassieke commutator van groepen, als de Peiffer commutator van pre-gekruiste modulen voorbeelden zijn.

Tenslotte leggen we een link tussen deze Peiffer commutator en de commutator van Smith uit de universele algebra [6]. Dit laat ons toe een notie van "interne" Peiffer commutator te definiëren.

References

- [1] R. Brown and G. J. Ellis, *Hopf formulae for the higher homology of a group*, Bull. London Math. Soc. **20** (1988), 124–128.
- [2] H. Hopf, *Fundamentalgruppe und zweite Bettische Gruppe*, Comment. Math. Helv. **14** (1942), 257–309.
- [3] G. Janelidze, *Pure Galois theory in categories*, J. Algebra **132** (1990), 270–286.
- [4] G. Janelidze and G. M. Kelly, *Galois theory and a general notion of central extension*, J. Pure Appl. Algebra **97** (1994), 135–161.
- [5] G. Janelidze, L. Márki, and W. Tholen, *Semi-abelian categories*, J. Pure Appl. Algebra **168** (2002), 367–386.
- [6] J. D. H. Smith, *Mal'cev varieties*, Lecture notes in mathematics, vol. 554, Springer, 1976.
- [7] J. Stallings, *Homology and central series of groups*, J. Algebra **2** (1965), 170–181.
- [8] U. Stammbach, *Anwendungen der Homologietheorie der Gruppen auf Zentralreihen und auf Invarianten von Präsentierungen*, Math. Z. **94** (1966), 157–177.

5 Miscellaneous

5.1 From UMH

Le séminaire interuniversitaire de logique mathématique reprendra ses activités hebdomadaires début octobre. Pour toute information sur le programme et les lieux, veuillez consulter en temps utile le site:

<http://math.umh.ac.be/logic/seminars.htm>

ou contacter les organisateurs par email: christian.michaux@umh.ac.be

En outre un programme spécial en théorie des modèles et applications aura lieu à l'UMH pendant l'année 2007-2008. Ce programme est en partie subventionné par le réseau européen MODNET. Pour les horaires et locaux, veuillez contacter les organisateurs mentionnés pour chaque activité:

1. Cours préparatoire de théorie des modèles
Titulaire : C. Michaux (UMH)
Résumé : Ce cours aborde les définitions et les théorèmes de base de la théorie des modèles.
Durée : 30h - Quadrimestre : 1 (semaines 1 à 8)
Lieu : UMH
Contact : christian.michaux@umh.ac.be
2. Théorie des modèles et applications
Titulaires : C. Michaux (UMH), F. Point (UMH). (12 ECTS)
Résumé : La théorie des modèles a, depuis les années nonantes, multiplié les contributions spectaculaires à l'étude de conjectures en géométrie algébrique et diophantienne. Les outils nécessaires à la compréhension de ces résultats seront l'objet du cours. Certains détails techniques des applications abordées seront l'objet des cours *Théorie de la valuation* et théorie des corps différentiels.
Durée : cours 30h - Quadrimestres : 1 (seconde moitié) et 2
travaux dirigés 90h - Quadrimestres 1et 2
Lieu : UMH
Contacts : christian.michaux@umh.ac.be; point@logique.jussieu.fr
3. Théorie de la valuation
Titulaire : N. Guzy (UMH). (6 ECTS)
Résumé : La théorie des anneaux valués sera abordée du point de vue de la théorie des modèles.
Durée : cours 15h - Quadrimestre : 2
travaux dirigés 45h - Quadrimestre 2
Lieu : UMH
Contact : nicolas.guzy@umh.ac.be
4. Théorie des corps différentiels
Titulaire : C. Rivière (UMH). (6 ECTS)
Résumé : La théorie des modèles des corps différentiels sera l'objet de ce cours.
Durée : cours 15h - Quadrimestre : 2
travaux dirigés 45h - Quadrimestre 2
Lieu : UMH
Contact : cedric.riviere@umh.ac.be
5. MODNET Training Workshop: 20–26 avril 2008
Thèmes : Théorie des modèles finis, théorie des modèles des p-adiques et intégration motivique.
Lieu : La Roche-en-Ardenne.
Contacts : christian.michaux@umh.ac.be; point@logique.jussieu.fr
6. Introduction à la théorie des schémas
Titulaire : F. Trihan (UMH). (12 ECTS)
Résumé : On donnera une introduction à la théorie des schémas de A. Grothendieck (Référence : Algebraic geometry de R. Hartshorne).
Durée : cours 30h - Quadrimestre : 1
travaux dirigés 90h - Quadrimestres 1et 2
Lieu : UMH
Contact : Fabien.Trihan@umh.ac.be

5.2 Euler...

2007 is

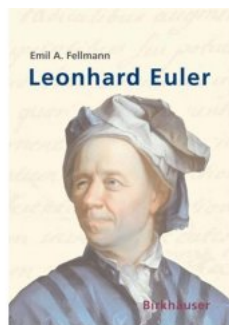
THE YEAR OF EULER (Leonhard Euler 1707 - 1783) - EULER TERCENTENARY ...

In this edition, see Adhemar Butheel's article on the next pages and gallery on the first ones. Visit the the Euler Shop at <http://www.mathematicianspictures.com/EULER/Euler300.htm> and more...

Leonhard Euler *Emil A. Fellman*, (English translation by E. and W. Gautschi), Birkhäuser, Basel, CH, 2007 (xv+179 p.), Hard cover, ISBN 978-3-7643-7538-6, 29.90 €.

Leonhard Euler, A Man to Be Reckoned with *Andreas K. Heyne and Alice K. Heyne* (text) and *Elena Pini* (illustrations), Birkhäuser, Basel, CH, 2007 (45 p.), Hard cover, ISBN 978-3-7643-8332-9, 19.90 €.

The original German edition of the Euler biography by Emil Fellman is now about 10 years old and finally an English translation by Erika and Walter Gautschi came out in 2007, 300 years after Euler's birth. Some of the original German citations are kept in the English edition but accompanied with an English translation. Fellman has chosen for a nontechnical text. No mathematical formulas are given and where some of the scientific work of Euler is discussed in separate sections, there are no technical details and these can be skipped without any problem if the reader so desires.



English edition



German edition

In a prologue Fellman gives his view on Euler as a man: an open cheerful mind, humorous and sociable, leading a modest life even when in the second half of his life, Euler was relatively rich. He was very generous in his scientific work, without quarrels about priority. The reason for his geniality was an extraordinary memory, a rare ability to concentrate¹, and of course simply hard work. Euler's life can be divided into four periods, which also correspond to the four chapters of the book.

The first period spans Euler's first 20 years in Basel (1707-1727). He had always been interested in mechanics and mathematics, but he got really hooked by a geometry course from Johann Bernoulli during his studies at the university of Basel, which he entered at 13², to study theology according to the wish of his parents.



Academy St. Petersburg

When he did not get a professorship there at the age of 20 (he then had almost no publications then), he was attracted to join two of the sons of Johann Bernoulli, namely Niklaus II and Daniel I, with whom he became good friends and also J. Hermann, another compatriot from Basel. All these had been invited by tsar Peter I to work in the newly founded Academy of Petersburg.

So, the second period (1727-1741) Euler spent in Petersburg. Many details are given about his adventurous journey to Russia. When Euler arrived, Catharina I, widow of Peter I had just died a week earlier and there was a succession battle going on.

In this period he married with Katharina (1733) and wrote his first major books on mechanics, hydrodynamics, arithmetic, and music theory.

The third period he spent in Berlin (1741-1766). He was proposed to join a Society that would later become the Science Academy which was a dream of king Frederick II of Prussia. The political situation in Petersburg where army officers were quartered in civilian houses and the fear that in all the commotion the wooden houses of Petersburg could easily catch fire³ contributed to Euler's decision to leave indeed for Berlin.

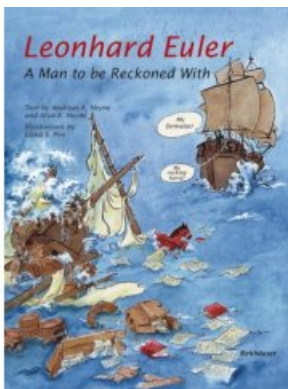
¹D. Thiébauld: "A child on his knees, a cat on his back, this is the way he wrote his immortal works".

²A normal age in those days when universities also had a propaedeutic role.

³Which indeed happened to Euler when in 1771 550 houses among his own burned down in Petersburg.

That was also a very fruitful period since then his major works on the calculus of variations, ballistics, analysis, differential calculus, astronomy, naval sciences, optics, and philosophy got published. King Frederick seemed more interested in the French scientists (d' Alembert and Lagrange) so that he did not asked Euler to become the next president of the Academy, and this will have helped Euler to think of returning to Petersburg (1766-1783).

He had negotiated very favorable conditions with Catherina II for his return so that he had a rather comfortable life. He had lost his right eye already in 1735 because of an infection, but now he needed a cataract operation on his left eye, after which he was almost totally blind. He continued to be unboundedly productive though. His introduction to algebra has been used by many generations and is probably only outperformed by Euclid's Elements. His wife Katharina died in 1776. They had thirteen children but eight of them died at young age. After loosing his sight, Euler felt rather helpless and wanted to remarry. This led to some discussion with his children but finally he remarried the half sister of his first wife. The last hours of his life he had been discussing the orbit of Uranus with his assistants. Around five o'clock he went to spend with his grandchildren, and to drink some tea. Sitting on th couch his pipe felt from his mouth. When he tried to pick it up, he grabbed his head and cried "Ich sterbe" and lost consciousness. He did not recover from this stroke and died at about eleven o'clock.



Fellman's book is richly illustrated with many historical grayscale images, which makes it a pleasant read. However, the comic strip, also published in hard cover is by definition much more illustrated with colour drawings. It does contain at the end a couple of pages of text giving a brief account of Euler's life and work an short items about many renowned people that lived in Euler's time. The strip itself is mainly anecdotal. Obviously not the main source of information, so that it can probably be appreciated best after some summary of Euler's life has been read already. One will obviously recognizes several episodes in Euler's life but it may be a bit confusing if the historical facts are not known.

Also this booklet is an English edition of a German original. The text is most of the time written in text balloons, which makes it easy to replace the German by the English words, but sometimes the text is integrated in the drawing. In that case the German is kept, but an English translation is given in footnotes.

There is always something to learn, even from a comic strip. This I found in a postscriptum at the end of the booklet. The Viaduc of Millau is Europe's highest motorway spanning the valley between Clermont-Ferrand and Montpellier in France. It was opened in 2004. It seems that in the information pavilion of the viaduc, there is a dedication to Euler. And rightfully so since indeed the stability calculations for the bridge certainly rely on Euler's formulas.

Adhemar Bultheel



Plaque at Euler's house in Berlin



Euler Grave at Alexander Nevsky Monastery



Viaduc de Millau

Announcement one week course 7-11 January 2008

Multiscale Modeling and Singular Perturbations

Speakers

Henk Broer
Arjen Doelman
Tasso Kaper
Martin Krupa

Singular perturbations arise naturally when the dynamical changes in systems occur at different time scales. These systems are called fast-slow systems or multiscale systems. Numerous examples arise in optics, chemistry, biology neurophysiology, celestial mechanics and pattern formation, to mention a few areas.

Geometric Singular Perturbation Theory is the mathematical framework that yields the tools, like the slow manifold and Fenichel's coordinates, to explore the complicated dynamical behaviour of these systems.

In this course there will be expositions of the fundamental mathematical concepts as well as lectures that highlight the various application areas.

There will be seminar talks (particularly on Friday) by the following speakers: Freddy Dumortier, Chris Jones, Floris Takens and Ferdinand Verhulst (all to be confirmed).

Location	University of Twente
Period	January 7-11, 2008
Course fee	400 € This includes lodging and all meals
Subscription	Mrs. Satie Bihari: s.bihari at utwente.nl
Information	Stephan van Gils: s.a.vangils at math.utwente.nl

This course is meant for PhD students and advanced Master students in mathematics and physics with interest in dynamical systems and/or any of the application areas mentioned above. The course will be organized under the auspices of the NWO-cluster 'Nonlinear Dynamics of Natural Systems'.