

**UNIVERSITY OF PARDUBICE**

**Faculty of Chemical Technology**

*Institute of Energetic Materials*

**CZ-532 10 Pardubice**

*<http://www.ntrem.com>*

***FRAMEWORK PROGRAM***

*proposal*

**of the twelfth seminar**

**„NEW TRENDS IN RESEARCH OF ENERGETIC  
MATERIALS“**



***NTREM 2009***

**held at the University of Pardubice**

**Pardubice, the Czech Republic**

**April 1<sup>st</sup> - 3<sup>rd</sup>, 2009**

*intended as a meeting of students, postgraduate students, university teachers and  
young research and development workers, with interest in energetic materials*

**12<sup>TH</sup> INTERNATIONAL SEMINAR**  
**“NEW TRENDS IN RESEARCH OF ENERGETIC MATERIALS”**  
[http:// www.ntrem.com](http://www.ntrem.com)

**is supported by:**

*U.S. Army Int. Technology Center (Atlantic) - European Research Office in London*  
*Office of Naval Research Global, Middlesex (only Session 3, see on page 8)*  
*Schlumberger, Reservoir Characterization Group, Clamart Cedex, France*  
*Austin Detonator, Inc., Vsetín,*  
*Indet Safety Systems, Inc., Vsetín, a member of Nippon Kayaku group,*  
*Explosia, Ltd., Pardubice,*  
*Faculty of Chemical Technology, University of Pardubice,*  
*OZM Research, Hrochův Týnec*  
*BORGATA, Ltd., Praha 5*

**The twelfth** consecutive seminar on new trends in research of energetic materials is intended to be a world meeting of *young* people and university teachers working in the fields of teaching, research, development, processing, analyzing and application of all kinds of energetic materials. This seminar also covers explosions in gaseous, dispersed and condensed systems. It is not aimed only at the exchange of professional information but also at creating a pleasant meeting where young specialists from different countries have the opportunity to meet and gain personal contacts.

Papers should not only describe research work itself, but should also demonstrate awareness of the context and background for the research. The papers presented at this meeting will be quoted in the **Chemical Abstracts**.

The seminar is organized by staff members of the Institute of Energetic Materials University of Pardubice and in accordance with the tradition of previous meetings will take place at the University Hall.

The official language of the seminar is **English** and all contributions shall be presented and written exclusively in the English language.

**Registration fee:** *Students and young researchers* free of charge, *other* free of charge, voluntary donation of \$100 to help co-sponsor the seminar would be greatly appreciated.

**Passports and visas:** the visitors from most countries outside EU need valid passport and visa when entering Czech Republic. Please contact the Czech Embassy or consulate in your country for more information (Czech Republic is a part of Schengen territory from January 01<sup>st</sup>, 2008).

**Registration:** via web form should be done before the end of March 30<sup>th</sup>, 2009.

**Proceedings** of the presented contributions will be prepared by the organizers of the seminar by the date of its opening; price of the proceedings will be 3500.- CZK (i. e. ~ \$160) printed version and 500.- CZK (i. e. ~\$23) CD version – the prices are valid at the time of the seminar. The Proceedings will be provided to the main authors free of charge.

**Please, monitor the Web sites    [http:// www.ntrem.com](http://www.ntrem.com) for updates**

## Chairman of the Seminar:

Prof. Svatopluk Zeman, D.Sc.

(IEM, FCT, University of Pardubice)

## Scientific Committee:

Chairman of the Committee:

Dr. Adam Cumming

(DSTL, Sevenoaks, U.K.)

Members of the Committee:

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(Nanyang Technological University, Singapore)

Prof. Alexandr Astachov

(Siberian State Technological University, Russia)

Dr. Anthony J. Bellamy

(Cranfield Univ, UK)

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(Military Univ. Technol., Warsaw, Poland)

Dr. Ruth Doherty

(Dept. of Homeland Security, Washington, USA)

Prof. Zdeněk Friedl

(Chem. Faculty, Brno Univ. of Technology, CR)

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(EADS/TDW, Schrobenehausen, Germany)

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(Univ. of Defence, Brno, Czech Rep.)

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(Zelinskii Inst. of Organic Chemistry, Moscow)

Prof. Peter Politzer

(Univ. of New Orleans, USA)

Dr. Scott A. Shackelford

(AFRL/PRSP, Edwards AFB, USA)

Prof. Yuanjie SHU

(Inst. of Chem. Materials, CAEP, Sichuan, China)

Prof. Valerii P. Sinditskii

(Mendeleev Univ. of Chem. Technol., Moscow)

Dr. Muhamed Sućeska

(Brodarski Inst., Zagreb, Croatia)

Assoc. Prof. Pavel Vávra

(IEM, FCT, Univ. of Pardubice, Czech Rep.)

Dr. Woodward Waesche

(SAIC, Gainesville, USA)

## Organizing Committee

Chairman of the Committee:

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(Austin Detonator, Vsetín)

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(Dean Office, FCT, University of Pardubice)

Organizing committee of NTREM

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## Affiliated activities:

The first meeting of the *SCIENTIFIC COMMITTEE* will be carried out on Tuesday, **March 31<sup>st</sup>, 2009**, at 6 p.m. in Pardubice, the second one on Thursday, **April 2<sup>nd</sup>, 2009** – see page 13.

In the case of participants interest it is possible to organize a visit of the Institute of Energetic Materials (IEM).

A friendly get-together for foreign participants and for workers and co-workers of IEM will be arranged at **Pardubice's Castle** on April 2<sup>nd</sup>, 2009 – see on page 13.

## Lecture program of the 12<sup>th</sup> NTREM – Wednesday April 1<sup>st</sup>

08:40 **Opening of seminar** – speech of Prof. Tomáš Wágner, PhD.,  
vice-dean of the Faculty of Chemical Technology

### 1. Session

Chairman: Dr. Woodward Waesche  
SAIC, Gainesville, USA

09:00 Adam Cumming (invited lecture)  
*Energetics Department, Dstl Fort Halstead, Sevenoaks, UK;*  
**Lessons Learned through Reasarch Collaboration – A View over 20 Years.**

09:30 Prof. Thomas Klapoetke (invited lecture)  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**Environmental Aspects in the Research of Energetic Materials.**

10:00 Joerg Stierstorfer; Thomas M. Klapötke; Stefan Sproll; Franz Martin  
*Ludwig-Maximilian University of Munich, Munich, Germany;e ....*  
**Azidotetrazoles - Promising Energetic Materials or Waste of Time?..**

10:20 Thomas M. Klapötke; Carles Miró Sabaté  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**Crystal Structures of Azole-Based Energetic Materials: Advances in Nitrogen-rich Chemistry.**

### 10:40 – 11:00 Coffee break

11:00 Anian Nieder; Thomas M. Klapötke; Burkhard Krumm; Reinhold Tacke; Dennis Troegel  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**A Study of Sila-Explosives and their Characteristics compared to the Carbon Analogues.**

11:20 Jae-Kyeong Kim; Jin-Hwan An; Hyoun-Soo Kim; Kee-Kahb Koo  
*Sogang University, Seoul, South Korea*  
**Crystallization of 1,1-diamino-2,2-dinitroethylene by Drowning-out.**

11:40 Stefan Ek; Nikolaj Latypov; Grégoire Hervé; Guy Jacob  
*Swedish Defence Research Agency (FOI), Tumba, Sweden;*  
**Synthesis of Di- and Trinitropyrazoles.**

12:00 Ekaterina Tatarnikova; Vladimir Sizov; Igor Tselinsky; Aleksandr Aleksandrov  
*Saint-Petersburg State Institute of Technology, Saint-Petersburg, Russia;*  
**Synthesis of 1H-benzo[d]imidazol-2(3H)-one polynitroderivatives.**

12:20 Veera Boddu; Krishnaiah Abburi, Reddy Damavarapu,  
*U.S. Army Engineer Research and Development Center, CERL, Champaign, U.S.A.*  
**A Simple Antisolvent Phase Separation Process for Purification of RDX.**

### 12:40 - 14:00 LUNCH BREAK

## 2. Session

Chairman: Prof. Michel Lefebvre  
*Royal Military Academy, Belgium*

- 14:00 Dr. Scott Shackelford *(invited lecture)*  
*Air Force Research Lab., AFRL/PRSP, Edwards AFB, CA, USA*  
**Heterocyclic Salt Synthesis and Rational Properties Tailoring.**
- 14:30 Yuanjie Shu; Yajun Luo; Ming Yin ; Junliang Du; Xinfeng Wang; Yang Zhou  
*China Academy of Engineering Physics, Mianyang, China*  
**Experimental and Theoretical Studies on Structure-Properties of some Important Energetic Materials.**
- 14:50 Michael Cartwright  
*Cranfield University, Shrivenham, United Kingdom;*  
**Investigation of Non heavy metal Detonators.**
- 15:10 Stanislaw Cudziło; Waldemar Trzcinski; Wojciech Kicinski  
*Military University of Technology, Warsaw, Poland*  
**Preparation and Characterization of Resorcinol-Formaldehyde Gels Impregnated with Ammonium Chlorate(VII) and Nitrate(V).**
- 15:30 Reddy Damavarapu  
*ARDEC; Picatinny, Dover, NJ, U.S.A.*  
**Novel Melt Cast Energetic Ingredients. ...**
- 15:50 – 16:10 Coffee break**
- 16:10 Philip Kneisl  
*Schlumberger, Roshamon, TX, U.S.A.*  
**The Ampule Thermal Stability Test.**
- 16:30 Collins; Mark Curling; Gabriel Dima; William Proud,  
*University of Cambridge, Cambridge, United Kingdom;*  
**Progress Towards Microwave Ignition of Explosives.**
- 16:50 Laurence Jeuniau; Michel H. Lefebvre; Pierre Guillaume  
*Royal Military Academy, Bruxelles, Belgium*  
**Ageing of a Spherical and a Flattened Propellant.**
- 17:10 Sara Cerri; Manfred A. Bohn; Klaus Menke; Luciano Galfetti  
*Fraunhofer-Institut fuer Chemische Technologie (ICT), Pfaffzettel, Germany;*  
**Ageing Behaviour of HTPB based Rocket Propellant Formulations.**
- 17:30 Gerhard Krause  
*Dr. Krause GmbH, Potsdam, Germany*  
**Kinetic and Material Parameter for various Explosives by Hot Storage Tests.**
- 17:50 Maciej Miszczak; Jacek Borkowski; Henryk Terenowski  
*Military Institute of Armament Technology, Zielonka, Poland;*  
**An analysis of Test Methods on Physicochemical Properties of Solid Rocket Propellants on the Basis of Polish Standards.**

...

## Lecture program of the 12th NTREM – Thursday April 2nd

### 3. Session – *Non-Ideal Explosives* sponsored by Office of Naval Research Global

Chairman: Dr. Ruth Doherty  
*Dept. of Homeland Security, Washington, USA*

Co-chairman: Prof. Hans Pasman  
*Texas A&M University, College Station, TX, U.S.A.*

08:40 Prof. Hans Pasman *(invited lecture)*  
*Mary Kay O'Connor Process Safety Center, Texas A&M University TX, U.S.A.*  
**Practical Safety Concepts: Structured Thinking Conditional for Optimum EM Work.**

09:10 Svetlana Kazakova, Georgii Kozak, Anna Kuznetsova *(invited lecture)*  
*Mendelejev University of Chemical Technology, Moscow, Russia*  
**Training Film to Laboratory Practical Work of Students on Theory of Burning and Explosion.**

09:30 Xiaomian HU, Junxia CHENG, Hao PAN, Kun YANG  
*Institute of Applied Physics and Computational Mathematics, Beijing, China*  
**Numerical Simulation of Non-Ideal Detonation of Condensed Explosives.**

09:50 Andrzej Paplinski  
*Military University of Technology, Warsaw, Poland*  
**Non-Ideal Regimes of Explosions in Air Suspensions of Reactive Materials.**

10:10 Stanislav Finyushin; Alexey Fedorov; Anatoly Mikhailov; Dmitry Nazarov; Tatiana Govorunova; Denis Kalashnikov; Evgenii Mikhailov,  
*Inst. of Physics of Explosion in Russian Federal Nuclear Center (VNIIEF), Sarov, Russia;*  
**Study of Over Compressed Modes in Detonation of Condensed HE.**

10:30 Matthew Price; Ang How-Ghee  
*Nanyang Technological University, Energetics Research Institute, Singapore, Singapore;*  
**Modeling Improvised Explosive Materials: Peroxides and Non-Ideal Mixtures.**

**10:50 – 11:10 Coffee break**

11:10 Viacheslav Egorshhev; Valery Sinditskii; Sergei Smirnov; Evgeny Glinkovsky; Viacheslav Kuzmin  
*Mendelejev University of Chemical Technology, Moscow, Russia*  
**A Comparative Study on Cyclic Acetone Peroxide ...**

11:30 Sara Wallin; Anna Pettersson  
*Swedish Defence Research Agency, Tumba, Sweden*  
**Standoff Explosives Detection Technologies - An Overview.**

11:50 Joseph E. Backofen  
*BRIGS Co., Moneta, Virginia, U.S.A.*  
**The Two-Stage Detonation Propulsion Model: Exploring How the 1st Stage Affects Detonation-Driven Materials.**

12:10 Colin Pulham; David Millar; Iain Oswald; William Marshall; Duncan Francis; Adam Cumming; *The University of Edinburgh, Edinburgh, United Kingdom*  
**High-Pressure Structural Studies of Energetic Materials.**

12:30 Hans-Jürgen Fahl  
*Bundeswehr Technical Center for Weapons and Ammunition, Meppen, Germany*  
**The Validation of the Explosive Fumes Dynamics in Rooms.**

**12:50 – 14:00 LUNCH BREAK**

**4. Session – Poster program – see on page 8**

## Lecture program of the 12th NTREM – Friday April 3rd

### 5. Session

Chairman: Dr. Adam Cumming  
*DSTL Sevenoaks, U.K.*

- 09:00 Dr. Manfred Held (invited lecture)  
*TDW, Schrobenuhausen, Germany;*  
**Blast Load Diagnostic .**
- 09:30 Marius Valeriu Cirmaci; Doru Adrian Goga, Rotairu Traian  
*Military Technical Academy, Bucharest, Romania;*  
**Shock Waves Generated by the Firing of Small Caliber Weapon Systems.**
- 09:50 Dmitry Meerov; Dmitry Ivanov; Konstantin Monogarov; Nikita Muravyev; Alla Pivkina;  
Yurii Frolov  
*Semenov Institute of Chemical Physics, Russian Academy of Science, Moscow, Russia*  
**Mechanical Activation of Al/MoO<sub>3</sub> Thermite as a Component of Energetic Condensed Systems to Increase its Efficiency.**
- 10:10 Nikita Muravyev; Yurii Frolov; Alla Pivkina; Konstantin Monogarov; Dmitry Ivanov;  
Dmitry Meerov  
*Semenov Institute of Chemical Physics Russian Academy of Science, Moscow, Russia*  
**Combustion of Energetic Systems Based on HMX and Aluminum: Influence of Particle Size and Mixing Technology.**
- 10:30 – 10:50 Coffee break**
- 11:10 Alexander Lukin  
*Southern Branch of the Russian State Hydro-Meteorological University of Saint-Petersburg, Tuapse, Russia*  
**Phenomenon of the Waves of Negative Erosion and Ballistic Efficiency of the High-Loading-Density Solid Propulsion System.**
- 11:30 Kresten J. Nielsen  
*Orica Mining Services, Denver, Colorado, U.S.A.*  
**High-Velocity Projectile Initiation of Emulsion Explosives.**
- 11:50 Jan Paca; Martin Halecky; Tereza Hudcova; Evguenii Kozliak,  
*Institute of Chemical Technology, Prague, Czech Republic*  
**Aerobic Biodegradation of 2,4-Dinitrotoluene in a Continuous Packed Bed Reactor and Effect of 4-Nitrotoluene Presence.**
- 12:10 - 12:30 CLOSING REMARKS including AWARDING OF PRIZES**

## Poster program of the 12th NTREM – Thursday April 2nd

### 4. Session

Chairman: Prof. Svatopluk Zeman  
*University of Pardubice, Czech Rep.*

Posters should be hung on Thursday, **April 2<sup>nd</sup>**, before 10:30. Special poster sessions will take place on Thursday (April 2<sup>nd</sup>) from 14:00 up to 17:00 h. During this time authors should be present for discussion at the posters.

- P.1 Thomas M. Klapötke; Burkhard Krumm; Mathias Scherr; Franz Xaver Steemann  
*Ludwig-Maximilian University of Munich, Munich, Germany;*  
**Preparation and Properties of Energetic Trimethylamine Derivatives.**
- P.2 Alexander A. Gidaspov; Vladimir V. Bakharev; Elena V. Velikanova;  
Igor V. Tselinsky (2)  
*Samara State Technical University, Samara, Russia;*  
**The fluoration of Dinitromethyl-1,3,5-triazine Salts with Xenon Difluoride.**
- P.3 Vladimir V. Bakharev; Alexander A. Gidaspov; Vladimir A. Zalomlenkov; Eugene A. Kozhevnikov  
*Samara State Technical University, Samara, Russia;*  
**The Investigation of the Interaction of 2,4,6-Trichloro-1,3,5-triazine with Salts of *gem*-Dinitrocompounds.**
- P.4 Stefan Sproll; Thomas M. Klapötke  
*Ludwig-Maximilian University of Munich, Munich, Germany;*  
**Bistetrazolyltetrazenes as Energetic, Nitrogen Rich Compounds.**
- P.5 Franziska Betzler; Thomas M. Klapötke; Stefan Sproll,  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**New Energetic Polymers Based on Cellulose.**
- P.6 Hendrik Radies; Thomas M. Klapötke  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**1-(1,1-Dihydroperfluoroalkyl)-5-perfluoroalkyl Tetrazoles.**
- P.7 Alessandro Contini; Anthony Bellamy; Matt Andrews  
*Cranfield University, Shrivenham, United Kingdom*  
**On the reaction of NTO (3-nitro-1,2,4-triazol-5-one) and FOX-7 (1,1-diamino-2,2-dinitroethene) with Alkyl Isocyanates.**
- P.8 Adam Collins (1); William Proud (1)  
*University of Cambridge, Cambridge, United Kingdom*  
**Environmentally Friendly Energetic Materials: Another Look at the Styphnates.**
- P.9 Václav Svachouček; Petra Svachoučková; Ladislav Velehradský; Karel Ventura  
*Defence Standardization, Codification and Government Quality Assurance Authority, Prague, Czech Republic*  
**The Dependence of Composition Gun Shot Residues on the Gun Barrel Length.**
- P.10 Joerg Stierstorfer; Thomas M. Klapötke,  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**A Green Replacement of Lead Azide: Calcium 5-Nitriminotetrazolate.**



- P.11 Michael Göbel; Thomas M. Klapötke  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**Replacement of RDX and HMX: BTAT, a Structural Isomer of CL-20.**
- P.12 Michael Göbel; Thomas M. Klapötke  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**Replacement of TNT: BTHC, an Insensitive Melt Castable Explosive with Positive Oxygen Balance.**
- P.13 Norbert Mayr  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**Smokeless Pyrotechnical Colorants Based On 1,2,4-Oxadiazol-5-onate Salts.**
- P.14 Thomas M. Klapötke; Martin H. Kunzmann; Norbert T. Mayr  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**Insensitive Explosives and Propellants Based On 1,2,4-Oxadiazol Derivatives.**
- P.15 Zdeněk Jalový, Jaromír Foud  
*Institute of Energetic Materials, University of Pardubice, Czech Republic;*  
**Reaction of Ethylenedinitramine with Dihalogenmethanes.**
- P.16 Vera Hartdegen; Thomas M. Klapötke; Stefan Sproll  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**New Energetic Materials Based on 2H-tetrazole-5-carboxylic Acid.**
- P.17 Carles Miró Sabaté  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**Energetic Salts of Low Symmetry Methylated 5-Aminotetrazoles.**
- P.18 Carles Miró Sabaté  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**Pyrotechnics, Propellants and Explosives: Bridged 5-Nitrotetrazole Derivatives.**
- P.19 Thomas M. Klapötke; Jörg Stierstorfer; Karina R. Tarantik  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**Salts of 1-(2-Chloroethyl)-5-Nitriminotetrazole - New Candidates for Coloring Agents in Pyrotechnic Compositions.**
- P.20 Franz A. Martin; Jörg Stierstorfer; Thomas M. Klapötke  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**Derivatives of Nitrated 1,5-Diaminotetrazole - A new Class of Energetic Materials.**
- P.21 Franz A. Martin, Margaret-J. Crawford, Thomas M. Klapötke; Konstantin Karaghiosoff  
*Ludwig-Maximilian University of Munich, Munich, Germany*  
**Novel Nitrogen Rich Salts Based on 4,5-Dicyano-1,2,3-triazole.**
- P.22 Shunguan Zhu  
*Nanjing University of Science and Technology, Nanjing, China*  
**Eutectic Compound of Perchloric Amine Salt.**
- P.23 Gennady Rudakov  
*Mendelejev University of Chemical Technology, Moscow, Russia*  
**Synthesis of Energetic Compounds from 5-Azido-2,2-dimethyl-5-nitro-1,3-dioxane.**
- P.24 Alexander A. Kushtaev; Nikolaj V. Yudin; Vitol'd L. Zbarsky  
*Mendelejev University of Chemical Technology, Moscow, Russia*  
**The Nitration Peculiarity of 6-Hydroxy-2-methylpyrimidine-4(3H)-one to 6-Hydroxy-2-methyl-5-nitropyrimidine-4(3H)-one.**
- P.25 Junwoo Kim; Jae-Kyeong Kim; Hyoun-Soo Kim; Kee-Kahb Koo  
*Sogang University, Seoul, South Korea;*

**Crystallization of RDX with an Internal Seeding Technique for Reduction of Solvent Inclusion.**

- P.26 Victor Stepanov; Wendy Balas; Lev Krasnoperov  
*US Army, ARDEC, Picatinny, New Jersey, U.S.A.;*  
**Processing and Characterization of Nano RDX.**
- P.27 Radovan Skácel; Jan Zigmund; Pavel Mareček; Pavel Prchal; Martin Karnet; Jan Skládal  
*Explosia a.s., Pardubice-Semtín, Czech Republic;*  
**Precipitated RDX and TAGN particles for use in propellants.**
- P.28 Anthony Bellamy; Peter Golding; Mary Mahon  
*Cranfield University, Shrivenham, United Kingdom*  
**Crystal Habit of LLM-105 (2,6-Diamino-3,5-dinitropyrazine 1-oxide).**
- P.29 Anthony J. Bellamy  
*Cranfield University, Shrivenham, United Kingdom;*  
**Identification of *alpha*-Chloro-2,2',4,4',6,6'-hexanitrobibenzyl as an Impurity in Hexanitrostilbene (HNS).**
- P.30 Alexander M. Astachov; Alexander D. Vasiliev; Andrew A. Erashov; Ludmila A. Kruglyakova; Rudolf S. Stepanov  
*Siberian State Technological University, Krasnoyarsk, Russia;*  
**The Crystal and Molecular Structure of 3-Nitro-1-trinitromethyl-1,2,4-triazole.**
- P.31 Michael Herrmann; Ulrich Förter-Barth; Paul Bernd Kempa  
*Fraunhofer Institut Chemische Technologie, Pfinztal, Germany;*  
**Size/strain Diffraction Peak Broadening of the Energetic Materials RDX, ADN and FOX-7.**
- P.32 Alexander M. Astachov; Vitaliy A. Revenko; Eduard S. Buka  
*Siberian State Technological University, Krasnoyarsk, Russia;*  
**Impact Sensitivity of Nitrimines.**
- P.33 Denis Kokovikhin; Alexander Dubovik,  
*Mendelejev University of Chemical Technology, Moscow, Russia;*  
**Characteristics of Sensitivity to Impact Ammonium Perchlorate and Its Composition with Al and Al<sub>2</sub>O<sub>3</sub>.**
- P.34 Rudolf S. Stepanov; Ludmila A. Kruglyakova; Alexander M. Astachov,  
*Siberian State Technological University, Krasnoyarsk, Russia;*  
**Influence of Structure on the Thermal Decomposition Rate of Formals of Polynitroalcohols in Liquid Phase.**
- P.35 Ivona Fiamengo; Muhamed Sućeska; Sanja Matečić Mušanić  
*Brodarski institut-Marine Research & Advanced Technologies, Zagreb, Croatia;*  
**Applicability of Thermal Methods for Determination of Nitroglycerin Content in Double Based Propellants.**
- P.36 Muhamed Sućeska; Sanko Bakija; Janoš Kodvanj; Sanja Matečić Mušanić ; Ivona Fiamengo; Ante Bakić  
*Brodarski institute-Marine Research & Advanced Technologies, Zagreb, Croatia*  
**Study of Mechanical Properties of Rocket DB Propellant During Natural Ageing.**
- P.37 Igor Kovalenko; Olexandr Kuprin  
*Ukrainian State University of Chemical Technology, Dnepropetrovsk, Ukraine*  
**Features of Thermal Decomposition of Nitrate of Ammonium in Open Systems.**
- P.38 Jiri Majzlik  
*Institute of EnergeticMaterials, University of Pardubice, Czech Republic*  
**ESD Sensitivity of Fine Grade Powdered HMX – Al mixture.**

- P.39 Dalibor Kuhinek; Igor Zorić; Vinko Šrklec,  
*University of Zagreb, Zagreb, Croatia*;  
**Influence of the Current Pulse Shape to the Measurement of Electric Detonators Firing Pulse.**
- P.40 Yong Liu; Yuan-jie Shu, Xue-yong Liu; Ying Xiong ; Fa-chun Zhong; Yi Sun  
*China Academy of Engineering Physics, Mianyang, China*;  
**Fluorescence Analysis Technique of Explosive Detection.**
- P.41 Jonas Šarlauskas; Kastis Krikštopaitis; Kęstutis Sekmokas; Narimantas Čenas  
*Institute of Biochemistry, Vilnius, Lithuania*;  
**Voltammetric Redox Behavior of High Energy Aromatic and N-Heterocyclic Nitrocompounds.**
- P.42 Edward Aluker; Alexander Krechetov; Denis Nurmukhametov; Alexander Tupitsyn  
*Kemerovo State University, Kemerovo, Russia*;  
**Temperature Dependencies of Laser Initiation of PETN.**
- P.43 Edward Aluker; Alexander Krechetov; Anatoliy Mitrofanov; Alexander Pashpekin; Alexander Samarov  
*Kemerovo State University, Kemerovo, Russia*;  
**Pre-explosive Emission of Electrons from Silver Azide.**
- P.44 Lemi Türker; Taner Atalar,  
*Middle East Technical University, Ankara, Turkey*;  
**Computational Investigation of Nitroglycol (EGDN), Ethylenedinitramine (EDNA) and their Sulfur Analogs (Thionitrates).**
- P.45 Roman Tsyshevsky  
*Kazan State Technological University, Kazan, Russia*;  
**A Theoretical Study of 1.1-Dinitropropane Decomposition.**
- P.46 Jane S. Murray, Pat Lane, Michael Göbel, Thomas M. Klapötke, Peter Politzer  
*Dept. of Chemistry, University of New Orleans, Louisiana 70148, USA*;  
**Reaction Force Analysis of Nitro/*Aci* Tautomerization**
- P.47 Xiao-wei Fan; Xue-hai Ju; He-ming Xiao  
Department of Chemistry, Nanjing Univ. of Science and Technology, Nanjing, China  
**Computational Study of Complexes between RDX, HMX, CL-20, ADN and Nitrogen Heterocyclic Energetic Compounds.**
- P.48 Nelly Zhokhova; Tatyana Pivina; Lyubov Maslova; Yuriy Matyushin; Alexey Zefirov  
*Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, Moscow*;  
**Artificial Neural Networks in Energetic Materials Enthalpy of Formation Calculations.**
- P.49 David Lempert; Gelii Nechiporenko; Svetlana Soglasnova  
*Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*; *l*  
**Energetic Parameters of Dinitramine Salts of High Enthalpy Polynitrous Bases.**
- P.50 Bogdan Czajka; Leszek Wachowski; Zenon Foltynowicz; Katarzyna Lipinska; Marek Lipinski; Stanislaw Tabat  
*Institute of Non-ferrous Metals Branch in Poznan, Poznan, Poland*  
**The Influence of Mo, Ti and nano-Fe on Selected Properties of High Calorific Fe-KClO<sub>4</sub> Mixture.**
- P.51 *Ahmed E. Hawwass*  
Center Research, Cairo, Egypt;  
**Different Kinds of Decoy Flares Based on Different Types and Percentage of Fuel.**

- P.52 Robert Zalewski (1); Tomasz Wolszakiewicz (2)  
*Inst. of Machines Design Fundamentals, Warsaw Univ. of Technology, Warsaw, Poland;*  
**Viscoplastic Model for Solid Propellants.**
- P.53 Tomasz Wolszakiewicz; Tomasz Gawor,  
*Institute of Industrial Organic Chemistry, Warsaw, Poland;*  
**Application of Optic Inspection in Solid Propellants Strength Experiments.**
- P.54 Traian Rotariu; Doru Adrian Goga; Sorin Razvan Esanu; Tudor Viorel Tiganescu; Marius Valeriu Cirmaci  
*Military Technical Academy, Bucharest, Romania;*  
**Study Regarding Effectiveness of Stabilizer Revival Process on Old Artillery Propellants. Part 2**
- P.55 Nadja Barl; Thomas M. Klapötke; Burkhard Krumm; Susanne Scheutzow; Franz Xaver Steemann  
*Ludwig-Maximilian University of Munich, Munich, Germany;*  
**Investigation of Products and Velocity of Detonation of Improvised Explosive Filler.**
- P.56 Zvonimir Ester  
*Faculty of mining geology and petroleum engineering, Zagreb, Croatia;*  
**Means of Initiation and Velocity of Detonation of ANFO Explosives.**
- P.57 Kozak George; Starshinov Alexander; Litovka Olga, Kazakova Svetlana  
*Mendeleev University of Chemical Technology, Moscow, Russia;*  
**Design-Experiment Investigation of Mixtures on Base of Ammonium Nitrate, Carbamide and Biuret.**
- P.58 Andrzej Maranda; Piotr Košlik; Zenon Wilk  
*Military University of Technology, Warsaw, Poland*  
**Momentum Method Blast Wave Test for LWC Emulsion Explosives.**
- P.59 Mario Dobrilović  
*Faculty of mining geology and petroleum engineering, Zagreb, Croatia;*  
**Linear Shaped Charge with Emulsion Explosive.**
- P.60 Anna Veprikova; Vladimir Annikov; Vladimir Trunin; Alex Apolenis; Vlada Raikova  
*Mendeleev University of Chemical Technology, Moscow, Russia;*  
**Detonation Parameters of Watertel Aluminum-Containing Explosives.**
- P.61 Ilya Zhukov; Georgii Kozak; Alexander Tsvigunov  
*Mendeleev University of Chemical Technology, Moscow, Russia;*  
**Transformation of Aluminum at Explosion of its Mixtures with Benzoyl Peroxide.**
- P.62 Tamer A. Azem Elshenawy  
*Egyptian Armed Forces, Cairo, Egypt;*  
**Explosive Effect on the Performance Characteristics of Shaped Charges.**
- P.63 Piotr Košlik; Zenon Wilk; Waldemar Witkowski,  
*Institute of Industrial Organic Chemistry, Warsaw, Poland;*  
**Numerical Simulations of Linear Shaped Charge Cutting Using 3D LS-Dyna Code.**
- P.64 Alexey V. Fedorov  
*Russian Federal Nuclear Center - VNIIEF, Sarov, Russia;*  
**Neuman Spike and Detonation Wave Parameters in Condensed High Explosives.**
- P.65 Alexey V. Fedorov; A. L. Mikhailov; D. V. Nazarov; S. A. Finyushin; A. V. Men'shikh;  
*Russian Federal Nuclear Center - VNIIEF, Sarov, Russia;*  
**Shock Wave Initiation of Mixture Liquid Explosives.**

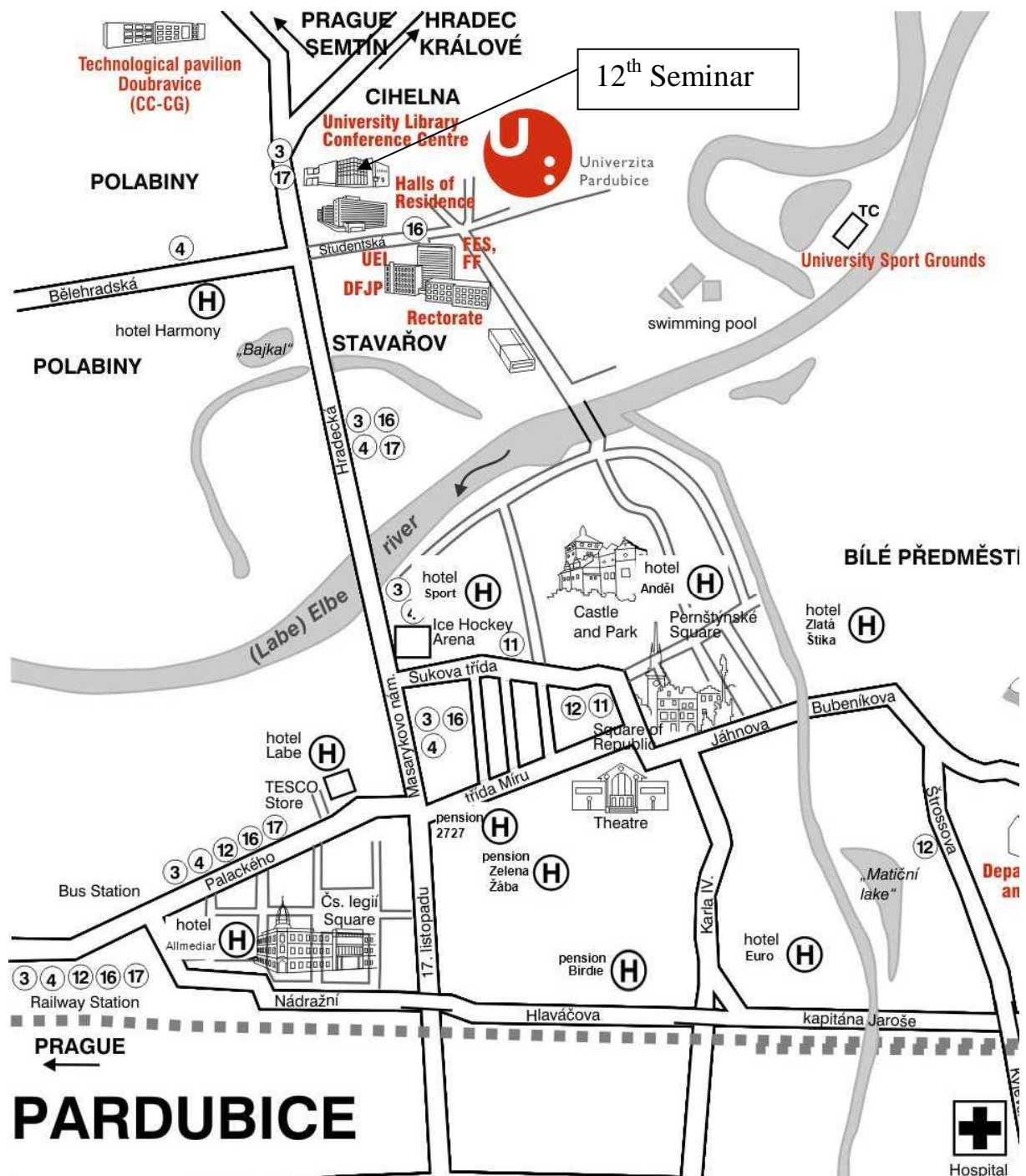
- P.66 Dmitry V. Nazarov; Alexey V. Fedorov; Anatoly L. Mikhailov; Stanislav A. Finyushin; Tatiana A. Govorunova; Alexey V. Men'shikh; Valery A. Davydov,  
*Institute of Physics of Explosion in Russian Federal Nuclear Center (VNIIEF), Sarov, Russia;*  
**Study of Detonation Wave Structure in Solid and Liquid Tetranitromethane (TNM).**
- P.67 Sameh El Basuony; Hosam Mostafa; Mohamed Seleet  
*Egyptian Armed Forces, Cairo, Egypt;*  
**The Effect of Different Additives on the Explosive Behaviour of Composition B.**
- P.68 Mu LI, Chuan-Jun YAN  
*School of Power and Energy, Northwestern Polytechnical Univ., Xi'an 710072,*  
**Detonation Characteristics of Gasoline/Air Mixtures in Pulse Detonation Engines.**
- P.69 Alan Catovic; Berko Zecevic; Jasmin Terzic  
*University of Sarajevo, Mechanical Engineering Faculty, Defense Technologies Department, Sarajevo, Bosnia and Herzegovina;*  
**Analysis of Terminal Effectiveness for Several Types of HE Projectiles and Impact Angles Using CAD Technique.**

**17:00     The second meeting of Scientific Committee (University Hall)**

**18:00 - 22:00        EVENING PROGRAM (at Pardubice's Castle)**

- 18:00-18:40    Visit of the exposition “**Bohemian glass**”  
                    Visit of the exposition “**Historical weapons**”
- 18:50-22:00    A friendly get-together in the Knight Hall  
                    Exhibition of the Historical fencing group (after dark)

## 12<sup>th</sup> SEMINAR - orientation map – town PARDUBICE



**Accommodation** (*orientation prices as of Jan. 31<sup>st</sup>, 2009*): based on experience from previous seminars, the participants will have to make reservation themselves. The accommodation is possible in variety of hotels in the center of Pardubice.

Hotel LABE:

phone: 00420 466 535 359  
fax: 00420 466 535 358  
E-mail: rezervace@hotellabe.cz  
approximate prices/night:  
1400.- CZK (\$65) single room  
1900.- CZK (\$88) one person apartments  
approx. 10 min. walk from the University Hall

Hotel ZLATA STIKA:

phone: 00420 46 6613478  
fax: 00420 46 6052130  
E-mail: zlata@stika.cz  
approximate prices/night:  
2500-3500 CZK (\$116-\$162) apartments  
1500-1900 CZK (\$70-\$88) single room  
1700-2100 CZK (\$79-\$97) double room  
approx. 25 min. walk from the University Hall

Hotel SPORT:

phone: 00420 46 651 22 21  
fax: 00420 46 651 20 62  
approximate prices/night:  
885.- CZK (\$41) single room  
1090.- CZK (\$50) double room  
approx. 10 min. walk from the University Hall

Pension 2727:

phone: 00420 466 615 400  
fax: 00420 466 612 451  
E-mail: penzion2727@seznam.cz  
approximate prices/night:  
1090.- CZK (\$50) single room  
1308.- CZK (\$60) double room  
1308.-CZK (\$60) apartments for one person  
approx. 20 min. walk from the University Hall

Hotel ALLMEDIAR:

phone: 00420 466 536 063  
fax: 00420 466 536 070  
E-mail: info@allmediar.cz  
approximate prices/night:  
1200.- CZK (\$55) single room  
1300.- CZK (\$60) double room  
2100.-CZK (\$97) apartments for one person  
approx. 25 min. walk from the University Hall

Hotel HARMONY:

phone/fax: 00420 466 435 020  
00420 466 435 025  
E-mail: [hotel@harmony-pce.cz](mailto:hotel@harmony-pce.cz)  
[recepc@harmony-pce.cz](mailto:recepc@harmony-pce.cz)  
approximate prices/night:  
1000.- CZK (\$467) single room  
1200.- CZK (\$55) double room  
1300.-CZK (\$60) apartments for two person  
approx. 3 min. walk from the University Hall

Hotel U ZLATEHO ANDELA:

phone: 00420 466 535 6 56  
fax: 00420 466 511 5 75  
E-mail: hotelzlandel@seznam.cz  
approximate prices/night:  
1100.- CZK (\$51) single room  
1300.- 2400 CZK (\$60-\$111) apartments/person  
approx. 25 min. walk from the University Hall

Pension BIRDIE

phone: 00420 466 053 255  
fax: 00420 466 053 256  
E-mail: info@birdie.cz  
approximate prices/night:  
1300.-CZK (\$60) single room  
1600.-CZK (\$74) double room  
1500.-CZK (\$69) apartments for one person  
approx. 30 min. walk from the University Hall

Hotel EURO:

phone: 00420 466 414 255  
fax: 00420 466 414 259  
E-mail: info@hoteleuro.cz  
approximate prices/night:  
1900.- CZK (\$88) single room  
2100.- CZK (\$97) double room  
approx. 30 min. walk from the University Hall

Pension ZELENA ZABA (*Green Frog*):

phone: 00420 466 616 016  
fax: 00420 466 616 016  
E-mail: info@zelenazaba.cz  
approximate prices/night:  
1050.- CZK (\$49) single room  
1250.- CZK (\$58) double room  
1300.-CZK (\$60) apartments for one person  
approx. 25 min. walk from the University Hall

Note: *price of one meal in the town is about 200.-CZK (i. e. ~\$11.50)*