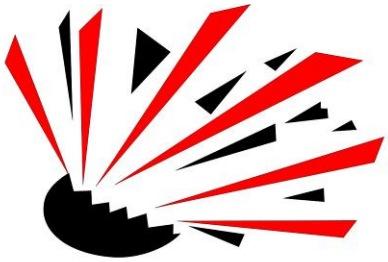
UNIVERSITY OF PARDUBICE
Faculty of Chemical Technology
Institute of Energetic Materials
CZ-532 10 Pardubice
http://www.ntrem.com

PROGRAM

(the sixth version)

of the twentieth seminar

„NEW TRENDS IN RESEARCH OF ENERGETIC MATERIALS“



NTREM 2017

held at the University of Pardubice

Pardubice, the Czech Republic

April 26th – 28th, 2017

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

20TH INTERNATIONAL SEMINAR
"NEW TRENDS IN RESEARCH OF ENERGETIC MATERIALS"
http://**www.ntrem.com**

is supported by:

Austin Detonator, Inc., Vsetín,
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Faculty of Chemical Technology, University of Pardubice,

The twentieth consecutive seminar on new trends in research of energetic materials is intended to be a world meeting of *young* people, university teachers and specialists working in the fields of teaching, research, development, processing, analyzing and application of all kinds of energetic materials. The main focus of this year's meeting will be aimed towards *Modern Experimental Techniques and Diagnostics for Energetic Materials* but attention will also be devoted to other problems related to energetic materials. 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 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 CR. Please contact the Czech Embassy or consulate in your country for more information (CR is a part of Schengen territory).

Registration: via web form should be done before the end of April 17th, 2017. Registration of participants after this date will take place at the University Hall:

April 25th	3:00PM - 7:00 PM	*with welcome snack at University Hall*
April 26th	7:30AM - 10:00 AM	

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. ~ $140; €130) printed version and 500.- CZK (i. e. ~$ 20, € 20) 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, watch the web site http://www.ntrem.com for updates

Chairman of the Seminar:

Prof. Svatopluk Zeman	*IEM, FCT, University of Pardubice, CR*

Chairman of the Scientific Committee:

Prof. Adam Cumming	*University of Edinburgh, G.B..*

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Prof. Svatopluk Zeman	*University of Pardubice, Czech Republic*
Prof. Chaoyang Zhang	*Inst. Chem. Materials, CAEP, Mian Yang, China*
Prof. Jianguo Zhang	*Beijing Inst. of Technology, Beijing, China*

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Dr. Marcela Jungová	*IEM, FCT, University of Pardubice, CR*
Dr. Iva Ulbrichová	*Dean Office, FCT, University of Pardubice*

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University of Pardubice
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CR, European Union

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Affiliated activities:

The first meeting of the ***SCIENTIFIC COMMITTEE*** will be carried out on Tuesday, **April 25th, 2017**, at 6 p.m. in **Ristorante Cartellone** (*near the flood-gate on the Elbe river*) the second one on Thursday, **April 27st, 2017,** at 16:30 in the University Hall – see page 7.

A friendly get-together for foreign participants and for workers and co-workers of IEM will be arranged at **Pardubice's Chateau** on April 27th, 2017 – see page 18.

Lecture program of the 20th NTREM – Wednesday April 26th

08:10 **Meeting of all speakers** of the first Session with Chairman of this Session.

08:40 **Opening of seminar** – speech of Prof. Miroslav Ludwig, *Chancellore of Univ. Pardubice*

1. Session

Chairman**:** Dr. Ruth Doherty
University of Maryland, Maryland, USA

08:50 Adam Cumming *invited lecture*
University of Edinburgh, Edinburgh, United Kingdom
Energetic Materials – Past, Present and Future

09:20 Stefan Ek,
The Swedish Defence Research Agency (FOI), Tumba, Sweden
Where we are, how we got there, and the way ahead in an FOI perspective .

09:40 Tomasz Witkowski, Dennis Fischer, Jennifer L. Gottfried, Konstantin Karaghiosoff, Thomas M. Klapötke, Jörg Stierstorfer
Ludwig-Maximilian University of Munich, Munich, Germany
Synthesis and characterization of N,N′-methylene bridged bis(nitropyrazoles).

10:00 Leonid Fershtat, Margarita Epishina, Alexander Larin, Igor Ovchinnikov, Ivan Ananyev, Mikhail Makhov, Nikita Muravyev, Nina Makhova
Russian Academy of Sciences, Zelinsky Institute of Organic Chemistry, Moscow,
Synthesis and cocrystallization of bi-1,2,5-oxadiazole nitro derivatives.

10:20 Stuart Kennedy
University of Edinburgh, Edinburgh, United Kingdom
Co-crystallization of energetic materials.

10:40 – 11:00 Coffee break

11:00 Daniel Ward, Paul Coster, Colin Pulham
University of Edinburgh, Edinburgh, United Kingdom
Preventing irreversible growth of DNAN by controlling its polymorphism.

11:20 Xianggui Xue, Chaoyang Zhang, Yushi Wen
China Academy of Engineering Physics, Mianyang, China
Molecular dynamics simulation study of the effects of crystal structures on the sensitivity of explosives.

11:40 Lei Zhang, Sheng-Li Jiang, Jun Chen
Institute of Applied Physics and Computational Mathematics, Beijing, China
A new understanding of the interplay of intermolecular and intramolecular interactions in hydrogen-absent molecular crystal.

12:00 Johann Glück, Thomas M. Klapötke, Magdalena Rusan, Anthony P. Shaw
Ludwig-Maximilian University of Munich, Munich, Germany
Effect of adding 5-aminotetrazole to anthraquinone-free new green colored pyrotechnical smoke formulations

12:20 - 14:10 LUNCH BREAK

*Pictures from the **2nd Seminar NTREM** in 1999 at the nowadays Faculty of Transport, University of Pardubice: in the first row on the left picture Prof. Bogdan Zigmund, Dr. Witold Pagowski, Prof. Andrzej Maranda, Prof. Stanislaw Cudzilo on the right picture Prof. Svatopluk Zeman, Prof. Andrzej Maranda, Prof. Stanislaw Cudzilo*

2. Session

Chairman: Prof. Tatiana S. Pivina
Zelinskii Inst. of Organic Chemistry, Moscow

14:00 **Meeting of all speakers** of the second Session with Chairman of this Session.

14:10 Alexander Vorozhtsov, Marat Lerner *invited lecture*
Tomsk State University, Tomsk, Russia
Nanoparticles for high energy materials. 20 years - where we were and where we are going.

14:40 Konstantin Monogarov, Alla Pivkina, Nikita Muravyev, Denis Dilhan
Semenov Institute of Chemical Physics, RAS, Moscow, Russia
Nano- and microthermites for the after-mission destruction of LEO satellite structures during their uncontrolled re-entry.

15:00 Fabien Léonard, Uta Hasenfelder, Holger Krebs, Giovanni Bruno
Bundesanstalt für Materialforschung und –prüfung (BAM), Berlin, Germany
X-ray computed tomography as a tool for 3D assessment of shock tube systems.

15:20 Kevin Serafin
CEA - Dam, Monts, France
Development of an impact test to study the hot spot formation in PBX.

15:40 Li-Yang Chen, Jian-Guo Zhang, Zun-Ning Zhou, Tong-Lai Zhang
Beijing Institute of Technology, Beijing, China
A biography of potassium complexes as versatile, green energetic materials.

16:00 – 16:20 Coffee break

16:20 Chaozhen Li, Nan Yan, Jun Cheng
Beijing Institute of Technology, Beijing, China
Research on reduced shock technology of laser-driven separation nut.

16:40 Jordan Homan, Dave Tod, Peter J. Gould, Ruth Tunnell, William Proud
QinetiQ Fort Halstead, Sevenoaks, United Kingdom
A Comparison of the mechanical and thermal properties of explosive simulants prepared using traditional and resonant acoustic mixing.

17:00 Kaiyuan Tan, Yong Han, Shanggang Wen, Guan Luo, Ying Ming
China Academy of Engineering Physics, Mianyang, China
Acceleration ability of HMX-based plastic-bonded explosives.

Participants of the 12th Seminar NTREM 2009 in a front of University Hall

Lecture program of the 20th NTREM – Thursday April 27th

3. Session

Chairman: Prof. Michael Gozin
University of Tel Aviv, Israel

08:00 Daniel Hooks *invited lecture*
Los Alamos National Laboratory, Los Alamos, NM, USA
A focus on fundamentals: an example of elasticity of explosives

08:30 Ahmed Hussein, Ahmed Elbeih, Svatopluk Zeman
University of Pardubice, Pardubice, Czech Republic
Performance characteristics of a new plastic explosive based on cis-1,3,4,6-tetranitrooctahydroimidazo-[4,5-d]imidazole (BCHMX) and 3-nitro-1,2,4-triazol-5-one (NTO).

08:50 Qiushi Wang, Jianxin Nie
Beijing Institute of Technology, Beijing, China
A comparative study on energy output of HNIW and HMX-based aluminized explosive.

09:10 Yuan Yuan, Pengwan Chen, Qiang Zhou,
Beijing Institute of Technology, Beijing, China
Numerical simulation and experimental study on double-layer shaped charge liner

09:30 Jianxin Nie, Rongqiang Liu,
Beijing Institute of Technology, Beijing, China
Simulation analysis on cutting capability of flexible linear shaped charge under different bending conditions.

09:50 James Edgeley, Christopher Braithwaite, Elizabeth Lee
University of Cambridge, Cambridge, United Kingdom
Review of experimental methods to characterize detonation waves in solid explosives..

10:10 – 10:30 Coffee break

10:30 Shiliang Huang, Jinjiang Xu, Qi Zhang, Yu Liu
China Academy of Engineering Physics, Mianyang, China
Single-crystal X-ray diffraction (SXRD) studies on energetic materials.

10:50 Nikita Muravyev, Konstantin Monogarov, Alexey Zhigach, Ilya Leipunsky, Igor Fomenkov, Alla Pivkina
Semenov Institute of Chemical Physics, Moscow, Russia
Exploring the enhanced reactivity of nanosized titanium toward oxidation.

11:10 Larisa A. Demidova, Vladimir A. Sizov, Anatoliy P. Denisyuk, Alexey O. Merkushkin
Mendeleev University of Chemical Technology, Moscow, Russ
Influence of various carbon materials on the catalysis of the propellant.

11:30 Ahmed Maraden, Petr Stojan, Robert Matyáš, Leoš Čermák
University of Pardubice, Pardubice
Subscale motor to investigate the effect of initial temperature on the burning process for solid propellants.

11:50 Guansong He,
China Academy of Engineering Physics, Mianyang, China
A bioinspired approach to enhancing mechanical and thermal conductivity properties of polymer bonded explosives assisted by polydopamine-coated multi-walled carbon nanotubes.

12:10 Vitaly Kiselev, Nikita Muravyev, Konstantin Monogarov, Alla Pivkina,
Novosibirsk State University, Novosibirsk, Russia
Interplay of highly accurate quantum chemical computations and thermal analysis techniques in the study of thermochemistry and decomposition mechanisms of energetic materials.

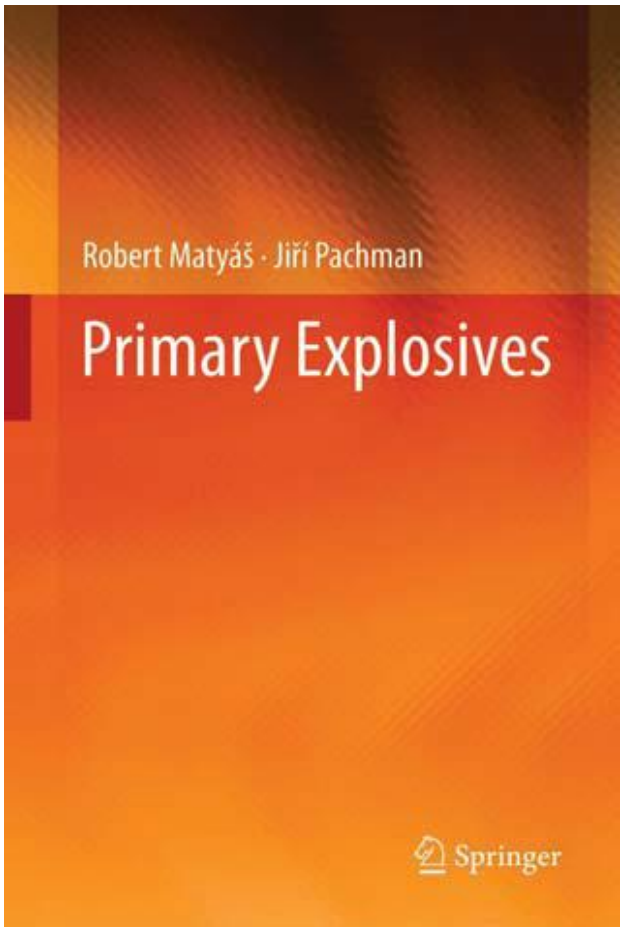
12:30 Charlotte Alliod, Roland Denis, Guy Jacob, Raphael Terreux
National Center for Scientific Research (CNRS) - LBTI-PRABILG, lyon, France
Prediction of regulation toxicological tests applied to High Energy Molecules.

12:50 – 14:30 LUNCH BREAK

4. ***Session* – Poster program –** see on page 10

16:30 The second meeting of Scientific Committee (*University Hall*)

A books advertising

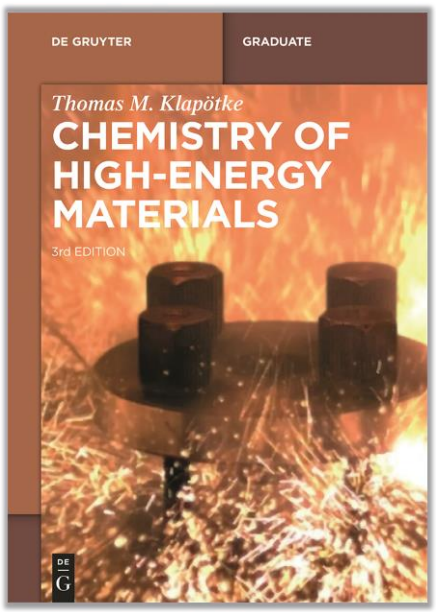


R. Matyáš, and J. Pachmáň,
Primary Explosives, Springer, Heidelberg 2012,
ISBN 978-3-642-28435-9, €106.95

Participants of the 19th Seminar NTREM in the University Hall on April 21st, 2016

Dr. Igor Plaksin presents his lecture on April 22nd, 2016
- one from the last photo of Igor, he died month upon this

Dr. Marcela Jungova transmits award for the best Chairman of Scientific Committee to Prof. Adam Cumming on April 22nd, 2016



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Lecture program of the 20th NTREM – Friday April 28th

5. Session

Chairman: Prof. Adam Cumming
University Edinburg, U.K.

09:00 Vladimir Zarko *invited lecture*
Institute of Chemical Kinetics and Combustion, Russian Academy of Sciences, Novosibirsk, Russia
Nanoenergetic materials: a new era in combustion and propulsion.

09:30 Manfred A. Bohn, Mauricio Ferrapontoff Lemos, Günter Mussbach
Fraunhofer Institut für Chemische Technologie (ICT), Pfinztal, Germany
Evaluation of concentration, type and particle size effects of fillers on the dynamic mechanical behaviour of elastomeric HTPB binder.

09:50 Wei Zhang, Qingjie Jiao, Xueyong Guo
Beijing Institute of Technology, Beijing, China
Influence of purification of energetic binders by vacuum rotary evaporation in different conditions.

10:10 Aleksandr Smirnov, Maija Kuklja
Bakhirev State Sci. Res. Inst. of Mechanical Engineering, Dzerzhinsk, Russia
To Possibility of using the heat of explosive transformation for the blast action estimation. Part 1: Individual explosives and their mixtures.

10:30 – 10:50 Coffee break

10:50 Chaoyang Zhang, Zhipeng Lu, Liya Meng, Wen Qian
China Academy of Engineering Physics, Mianyang, China
Thermal behaviors of TKX-50: Experiments and simulations.

11:10 Hong Z. Li
China Academy of Engineering Physics, Mianyang, China
Influence of crystal characteristics on the mechanical sensitivities of 2,6-diamino-3,5-dinitropyrazing-1-oxide.

11:30 Alexander Lukin
Western-Caucasus Research Center, Tuapse, Russia
Self-organized patterns formation and phenomenon of excitation of the unique set of holograms of the energetic materials reactionary zones.

11:50 – 12:50 CLOSING REMARKS including AWARDING OF PRIZES

Awarded young authors on the 19th NTREM 2016

<u>The best lectures</u> at the 19th NTREM (2016):
Mr. Tomasz Witkowski (LMU Munich)
Mr. Leonid Fershtad (Zelinskii Inst. Org. Chem,)),
Mr. Anatoly Bragin (Semenov Inst. of Chem. Phys.)

<u>The best posters</u> at the 19th NTREM (2016):
Mr. Norbert Szimhardt (LMU Munich)
Mr. Tomasz Witkowski (LMU Munich)
Dr. LIU Ning (Xian Modern Chem. Res. Inst.)

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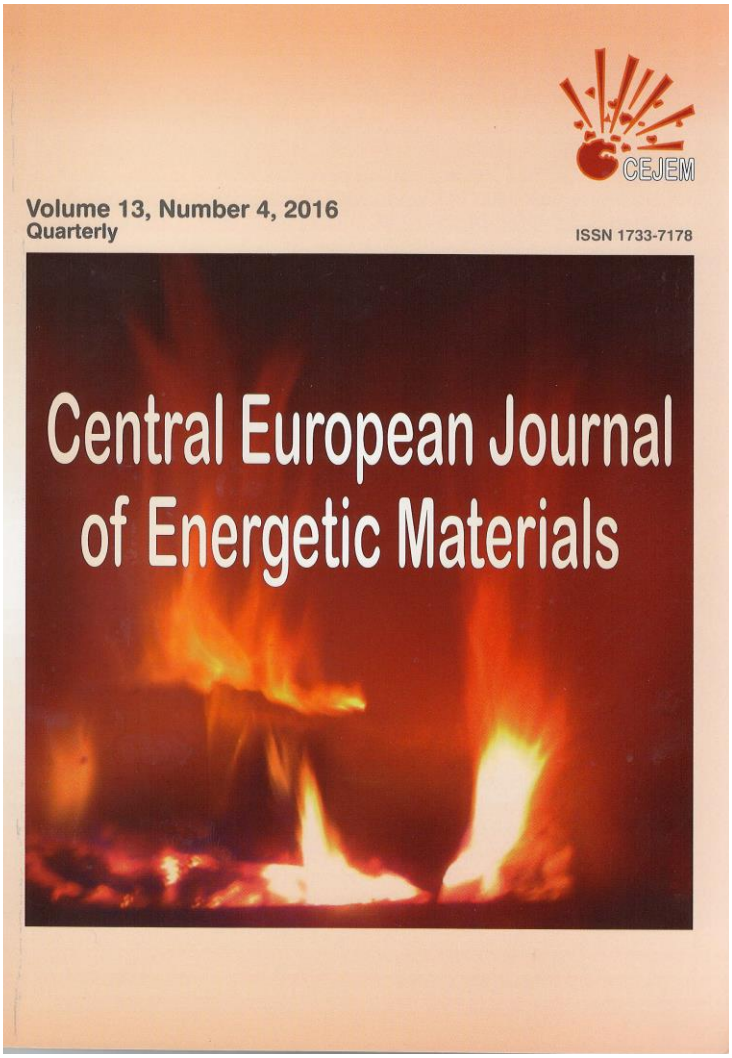

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Poster program of the 20th NTREM – Thursday April 27th

4. Session

Chairman: Prof. Svatopluk Zeman
University of Pardubice

Posters should be hung on **Wednesday**, ***April 26th***, before 14:00. Special poster sessions will take place on Thursday (***April 27st***) from 14:30 up to17:00 h. During this time authors should be present for discussion at the posters.

P.1 Luigi T. DeLuca,
Politecnico di Milano (RET), Milan, Italy
GALCIT projects: the birth of US rocketry.

P.2 Piotr Prasuła, Magdalena Czerwińska
Military Institute of Aramement Technology, Zielonka, Poland
Influence of accelerated ageing on thermo-mechanical properties of selected homogenous solid rocket propellants.

P.3 Zhou Wei-liang, Xiao Leqin, Zheng Qi-long,
Nanjing University of Science and Technology, Nanjing, China
Cloesd bomb burning properties of the single-base gun propellants coated with glycidyl azide polyurethane.

P.4 Justyna Hadzik, Piotr Koślik, Zenon Wilk, Łukasz Habera, Kamil Hebda, Antoni Frodyma
Institute of Industrial Organic Chemistry, Warsaw, Poland
Combustion testing of propellants with laboratory rocket motor and ballistic pendulum method.

P.5 Agnieszka Zmuda, Wawrzyniec Pniewski,
Military Institute of Armament Technology, Zielonka, Poland
The influence of elevated temperature of accelerated ageing according to STANAG 4620 method on molecular weight distribution of nitrocellulose.

P.6 Rafał Bogusz, Natalia Szemlińska, Paulina Magnuszewska, Bogdan Florczak, Andrzej Maranda
Institute of Industrial Organic Chemistry, Warsaw, Poland
Use of a nitric acid salts in the heterogeneous solid rocket propellants with low HCl content in combustion products.

P.7 David Lempert, Eugeniy Gusachenko, Gennadiy Nemtsev, Gelii Nechiporenko
Russian Academy of Science, Chernogolovka, Russia
Dispersion of condensed combustion products of solid composite propellants based on Zr or its hydride.

P.8 Kamil Hebda, Łukasz Habera, Antoni Frodyma, Edward Godzik, Potr Koślik, Justyna Hadzik,
Oil and Gas Institute - National Research Institute, Cracow, Poland
The research of characteristics of combusting homogeneous propellants in laboratory rocket motor.

P.9 Mohamed Abd-Elghany, Thomas m. Klapötke, Burkhard Krumm, Jörg Stierstorfer
Ludwig-Maximilian University of Munich, Munich, Germany
New smokeless double-base propellants based on oxalate, nitrocarbamate and formate.

P.10 Mohamed Samir Nawwar, Tamer Zakaria Wafy, Hosam Elsayed Mostafa
Reasearch Technical Centre, Cairo, Egypt
Effect of the particle size distribution of solid fillers on the mechanical properties of composite solid rocket propellant used with RAP application.

P.11 Ahmed Hawass
Reasearch Technical Centre, Cairo, Egypt
Additives effects on the performance of decoy flares.

P.12 Ahmed Hawass
Reasearch Technical Centre, Cairo, Egypt
Different types of binder for decoy flare compositions.

P.13 Richard Kuracina, Matej Menčík, Denisa Pangrácová, Zuzana Szabová
Slovak University of Technology in Bratislava, Trnava, Slovakia
Determination of explosion parameters of dust clouds depending on the location of igniter.

P.14 Serene Hay Yee Chan, Suceska Muhamed
Energetics Research Institute, Singapore, Singapore
An engineering approach to modeling sub-detonative events.

P.15 Mingchun Xian, Yanggang Meng, Junyao Xie, Hui Mei
Aerospace Pyrotechnics Technological Institute, luzhou, China
Research on the laser initiation based on STD.

P.16 Anton Zverev, Anatoly Mitrofanov, Alexander Khaneft, Natalya Ilyakova, Alexander Krechetov, Vadim Dolgachev
Kemerovo State University, Kemerovo, Russia
Hot plate" laser ignition of the condensed energetic material.

P.17 Anatoly Mitrofanov, Anton Zverev, Roman Tsyshevsky, Mikhail Kostyanko, Sergey Luzgarev, Guzel Garifzianova, Maija Kuklja
Kemerovo State University, Kemerovo, Russia
Photochemical initiation of PETN doped by organic carbonyl initiators.

P.18 Alexander Krechetov, Boris Aduev, Igor Liskov, Gennady Belokurov, Denis Nurmukhametov
Kemerovo State Universit, Kemerovo, Russia
Features of PETN explosive decomposition induced by an electron beam with the explosive-emission cathode.

P.19 Agnieszka Dylong, Anna Kwak, Kazimierz Szyszka, Waldemar Maliszewski
Military Institute of Engineer Technology, Wroclaw, Poland
The effect of aging process on physical and chemical properties of hight explosives.

P.20 Jovica Bogdanov, Zoran Bajić, Radenko Dimitrijević, Uroš Anđelić, Radun Jeremić
University of Defence, Belgrade, Serbia
Detonation velocity of different nitrocellulose based propellants.

P.21 Amy Lai, Lisa Richards
University College London, London, United Kingdom
Investigating the transport of gases and decomposition pathways in plasticized nitrocellulose materials.

P.22 Zoran Milenkovic, Sinisa Gacic
Technical Test Center, Belgrade, Serbia
Numerical and software solution in JAVA for interior ballistics problem of smokeless powders.

P.23 Teodora Zecheru, Ciprian Său, Claudiu Lăzăroaie, Mihaela Lăzăroaie, Marius Cîrmaci, Alexandru Dena
Scientific Research Center for CBRN Defense and Ecology, Bucharest, Romania
Hybrid ballistic gels - Dynamic impact evaluation.

P.24 Andreea E. Voicu, Gabriela Toader, Traian Rotariu, Octavian D. Orban
Military Technical Academy, Bucharest, Romania
Eco-friendly polymeric binders for energetic formulations

P.25 Leqin Xiao,
Nanjing University of Science and Technology, Nanjing, China
Effects of hard segment contents on cryogenic viscoelasticities of gap-based polyurethane elastomers.

P.26 Mehmet Eroglu, Turan Ozturk
Istanbul Technical University, Istanbul, Turkey
Mechano-chemical analysis of elastomeric gycidyl azide polymer networks.

P.27 Ying-ying Lu, Yuan-jie Shu, Ning Liu, Ke Wang, Zong-kai Wu, Yao Shu, Xiao-chuan Wang, Xiao-yong Ding
Xi'an Modern Chemistry Research Institute, Xi'an, China
Theoretical simulation of the glass transition temperature and mechanical properties of modified glycidyl azide polymer.

P.28 Yao Shu, Yong Yi, Jichuan Huo, Ning Liu, Ke Wang, Yuanjie Shu, Shaowen Zhang
Xi'an modern chemistry of institute, Xi'an, China
Molecular dynamic simulations of the properties of two poly-(phthalazinone ether sulfone ketone) (PPESK) and the interactions with the TNT.

P.29 Laurence Jeunieau, Miichel H. Lefebvre
Royal Military Academy, Bruxelles, Belgium
Characterisation of the thermal and explosive properties of mixtures of EGDN and additional energetic ingredients.

P.30 Jennifer L. Gottfried, Thomas M. Klapötke, Tomasz G. Witkowski
Ludwig-Maximilian University of Munich, Munich, Germany
Estimation of detonation velocities for TKX-50, MAD-X1, BDNAPM, BTNPM, TKX-55 and DAAF using the laser-induced air shock from energetic materials method.

P.31 Kibong Lee, Keundeuk Lee, Juseung Chae, Mingu Han, Haneul Park
Agency for Defense Development, Daejeon, South Korea
The effect of multi-modal particle system on shock sensitivity of highly filled pressable PBX.

P.32 Martin Künzel, Jindřich Kučera, Jiri Pachman
OZM Research, Hrochův Týnec, Czech Republic
OPTIMEX: Detonation pressure measurement using passive optical system.

P.33 Martin Künzel, Vojtech Pelikan, Miloslav Krupka
OZM Research, Hrochův Týnec, Czech Republic
On the importance of electrostatic discharge sensitivity testing.

P.34 Martin Künzel, Jakub Selesovsky, Jiri Pachman
OZM Research, Hrochův Týnec, Czech Republic
First attempts in cylinder expansion testing

P.35 Chong Zhang
Nanjing University of Science and Technology, Nanjing, China
Investigation on the stability of multisubstituted arylpentazoles and the influence on the generation of pentazolate anion.

P.36 Jichuan Huo, Yi Sun
Southwest University of Science and Technologhy, Mianyang, China
Theoretical study on thermal decomposition of 2,4-dinitroimidazole.

P.37 Margarita V. Shakhova, Vitaly G. Kiselev
Novosibirsk State University, Novosibirsk, Russia
Thermal decomposition of nitrogen-rich energetic compounds: new insights from high-level ab-initio calculations.

P.38 Kuktae Kwon, Jin Seuk Kim, Sojung Lee, Kibong Lee
Agency for Defense Development, Daejeon, South Korea
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P.39 Valery V. Serushkin, Valery P. Sinditskii, Trung H. Hoang, Sergey A. Filatov, Anna S. Shipulina, Igor L. Dalinger, Aleksandr Kh. Shakhnes, A.B. Sheremetev
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P.40 Vladimir A. Sizov, Dmitriy V. Pleshakov, Andrey F. Asachenko, Maxim A. Topchiy
Mendeleev University of Chemical Technology, Moscow, Russia
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P.41 Liudmila A. Krugliakova, Rudolf S. Stepanov
Reshetnev Siberian State Aerospace University, Krasnoyarsk, Russia
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P.42 Valeriy Domanskiy, Sergei Kostiukovskiy, Iury Iuninger, Igor Sobakin, Sergey Koshelev
Russian Acad. of Sci., Scientific and Technological Center of Unique Instrumentation, Moscow,
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P.43 Xolani Peter, Zetu Jiba
Council for Scientific And Industrial Research, Pretoria, Republic of South Africa
Effects of TNT contaminants soil on the vegetation at an explosive range by probing UPLC qTOF MS and FTIR analytical methods.

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University of Pardubice, Pardubice, Czech Republic
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P.45 Vladimir K. Golubev, Thomas M. Klapötke
Ludwig-Maximilian University of Munich, Munich, Germany
Physicochemical properties and exploding action of quite a number of new promising explosives. 2. Primary explosives.

P.46 Vladimir K. Golubev, Thomas M. Klapötke
Ludwig-Maximilian University of Munich, Munich, Germany
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P.47 Nikita V. Muravyev, Anna S. Nikiforova, Leonid I. Grishin, Mikhail S. Nechaev, Andrey F. Asachenko, Gleb A. Chesnokov, Alla N. Pivkina
Semenov Institute of Chemical Physics, Russian Academy of Science, Moscow
Metal bistetrazolates as catalysts for ammonium perchlorate decomposition and combustion

P.48 David Lempert, Anatoli Kazakov, Dmitrii Dashko, Albina Nabatova, Andrey Stepanov
Russian Academy of Science, Chernogolovka, Russia
Thermochemical and energetic properties of DNTF and DNFF.

P.49 David Lempert, Anatoli Kazakov, Telman Goncharov, Nikolai Pliskin, Konstantin Bozhenko, Andrey Utenyshev, Sergei Aldoshin, Dmitrii Dashko, Andrey Stepanov
Russian Academy of Science, Chernogolovka, Russia
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Russian Academy of Sciences, Zelinsky Institute of Organic Chemistry, Moscow
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Sogang University, Seoul, South Korea
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P.52 Radovan Skácel, Markéta Zikmundová, Jan Zigmund, Kamil Dudek,
Research Institute of Industrial Chemistry, Explosia Co., Pardubice, Czech Rep.
Influence of polyacrylamide and stearic acid on crystal growth of RDX Part II: Sensitivity testing of RDX in Composition B.

P.53 Joerg Stierstorfer, Norbert Szimhardt, Thomas Klapötke
Ludwig-Maximilian University of Munich, Munich, Germany
Copper(II) azide complexes with N-heterocyclic ligands as advanced primary explosives.

P.54 Ivan Gospodinov, Thomas M. Klapötke, Jörg Stierstorfer
Ludwig-Maximilian University of Munich, Munich, Germany
Nitrogen-rich salts of 3,4-bis(4-nitramino-1,2,5-oxadiazol-3-yl)-1,2,5-furoxan (BNAFF).

P.55 Thomas Reith, Burkhard Krumm, Thomas M. Klapötke
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New energetic nitrate esters based on tris-(hydroxymethyl)-aminomethane (TRIS).

P.56 Judyta Rećko, Rafał Lewczuk, Mateusz Szala
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P.57 Judyta Rećko, Rafał Lewczuk, Mateusz Szala
Military University of Technology, Warsaw, Poland
New explosive ionic compounds based on 5,5'-azotetrazole.

P.58 Maxim Radzhabov, Dmitry Khakimov, Igor Dalinger, Tatyana Pivina
Russian Academy of Sciences, Zelinsky Institute of Organic Chemistry, Moscow
Well-known methods for non well-known compounds: the high-energetic mesoionic cores.

P.59 Cornelia C. Unger, Burkhard Krumm, Thomas M. Klapötke
Ludwig-Maximilian University of Munich, Munich, Germany
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P.60 Davin Piercey, David Ford, Karl Oyler, Neha Mehta, Gartung Cheng, Andrew Pearsall
Nalas Engineering, Centerbrook, CT, USA
A convenient laboratory-scale preparation of dinitrogen pentoxide (N_2O_5).

P.61 Marc F. Bölter, Thomas M. Klapötke, Jörg Stierstorfer
Ludwig-Maximilian University of Munich, Munich, Germany
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P.62 Cheng Shen, Yuan'gang Xu, Ming Lu
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P.63 Avital Shlomovich, Adva Cohen, Tali Pechersky, Natan Petrutik, Qi-Long Yan, Monica Kosa, Alexander Aizikovich, Michael Gozin
School of Chemistry, Faculty of Exact Sciences, Tel Aviv University, Tel Aviv, Israel
Highly thermostable, insensitive green energetic isomers based on tetrazine-triazole derivatives.

P.64 Alexander M. Astachov, Denis V. Antishin, Eduard S. Buka
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The kinetics of hydrolysis of 4-nitrosemicarbazide and its salts.

P.65 Alexander M. Astachov, Denis V. Antishin, Eduard S. Buka, Yuri V. Gatilov, Andrew A. Nefedov, Eduard S. Buka,
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P.66 Andrei Stepanov, Vladimir Sannikov, Alexey Roslakov, Dmitry Dashko, Alexandr Astratev, Elena Stepanova
SDTB "Technolog", S.-Petersburg, Russia
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P.67 Svetlana Mel'nikova, Nikita Sentukov, Dmitrij Filippov
Saint-Petersburg State Institute of Technology (Technical University), Saint-Petersburg, Russia
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P.68 Jonas Šarlauskas
Vilnius University, Vilnius, Lithuania
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P.69 Daniel McAteer, Jean-Francois Pons, Lisa Blair
Centre for Defence Chemistry, Cranfield University, Defence Academy of the United Kingdom, Shrivenham
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P.70 Zhen Xu, Hongwei Yang, Guangbin Cheng
Nanjing University of Science and Technology, Nanjing, China
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P.71 Sergei Chapyshev, Denis Korchagin
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P.73 Amel Belaada, Waldemar Trzciński, Zbigniew Chyłek
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P.75 Yadollah Bayat, Ghazaleh Taheripouya
Malek Ashtar University of Technology, Tehran, Iran, Tehran, Iran
The synthesis of novel energetic salts based on N-(1-carboxymethyl-1H-tetrazol-5-yl)-hydrazinium.

P.76 Natalia L. Merkulova, Vjacheslav L. Korolev, Tatiana S. Pivina, Viktor P. Ivshin
Russian Academy of Sciences, Zelinsky Institute of Organic Chemistry, Moscow
Quantum chemical study of the mechanism of C-nitroimidazo[4,5-e]benzo[1,2- c;3,4- c']difuroxane formation.

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P.78 Michael M. Nardai, Manfred A. Bohn
Fraunhofer Institut für Chemische Technologie (ICT), Pfinztal, Germany
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P.79 Aleksandr Smirnov, Tatyana Pivina, Svatopluk Zeman
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P.80 Karolina Nikolczuk, Zenon Wilk, Piotr Koślik, Bogdan Florczak, Andrzej Marand
Institute of Industrial Organic Chemistry, Warsaw, Poland
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Military Technical Academy, Bucharest, Romania
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P.88 Seyed G. Hosseini, Hamid R. Ghaenii, Abdalfarid Abotorabe, Hossein Sharifnezhad, Manouchehr FathollahiDepartment of Chemistry Malek Ashtar University of Technology, Tehran, Iran
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University of Žilina, Žilina, Slovakia
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P.91 Nikita Muravyev, Konstantin Monogarov, Dmitry Prokopyev, Anatoly Bragin, Luciano Galfetti, Luigi DeLuca, Alla Pivkina
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Macro and microcrystalline waxes: advanced thermokinetic study of evaporation and decomposition under pressure variation.

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Physicochemical Properties of Sorbitol hexanitrate and its solutions in nitroglycerine and diethylene glycol dinitrate.

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Beijing Institute of Technology, Beijing, China
Oxidation mechanism of micron-sized aluminum particles in Al-CO2 gradually heating system.

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PP.6 Mikhail Ilyushin, Andrey Smirnov, Irina Shugalei, Vladimir Golubev
Saint-Petersburg State Inst. of Technol. (Technical University), Saint-Petersburg,
On the mechanism of pyrolysis of (5-nitrotetrazolato-N2)pentaamminecobalt (P) perchlorate.

PP.7 Vladimir K. Golubev, Michael A. Ilyushin
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Interaction of 1,3-butildiolferrocenylene and 1,1'-bis(1,3-butildiol)ferrocenylene with N-nitrocarbamide.

PP.10 Karl S. Hope, Hayleigh J. Lloyd, Sumit Konar, Craig L. Bull, Colin R. Pulham,
University of Edinburgh, Edinburgh, United Kingdom
Putting the squeeze on energetic co-crystals: high-pressure studies of 2(CL-20):HMX and CL-20:TNT.

In that time vice-rector of University Pardubice, Prof. Jiri Malek, is opening the 4th Seminar NTREM 2001

A well-known veteran of the Czechoslovak defence research & development, late Dr. Stanislav Brebera, in discussion at the 2nd Seminar NTREM 1999 in the nowadays Faculty of Transport, University of Pardubice

Dr. Fred Volk (ICT) during discussion at the 7th Seminar NTREM 2004

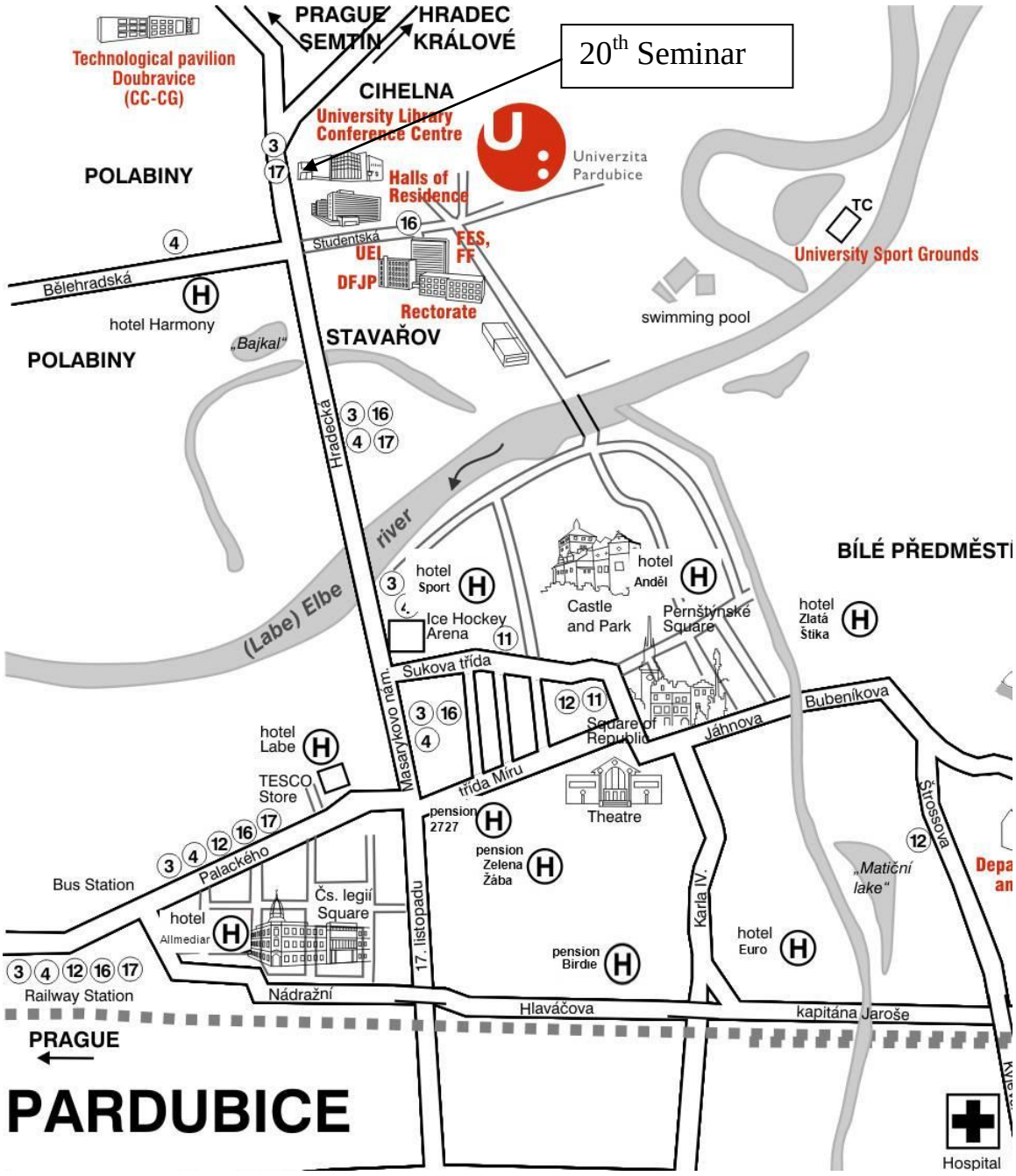
Evening's program of the 20th NTREM – Thursday April 27th

18:30 - 22:00 **EVENING PROGRAM** **(***at Pardubice's Chateau***)**
http://www.visitpardubice.com/

18:30 - 19:30 Visit of the expositions in the East Bohemia Museum

19:30 - 22:00 A friendly get-together in the Knight Hall

20th SEMINAR - orientation map – town PARDUBICE



The old town Pardubice – Pershtein square