

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

PROGRAM
of the 24th seminar

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



held at the University of Pardubice

Pardubice, the Czechia

April 6th – 8th, 2022

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

24TH INTERNATIONAL SEMINAR
“NEW TRENDS IN RESEARCH OF ENERGETIC MATERIALS”

<https://www.ntrem.com>

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The twenty fourth consecutive seminar on new trends in research of energetic materials, this year in its 25-year history, 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. This year's meeting aims to build on the long tradition on NTREM seminars unfortunately interrupted with Covid-19 pandemic. The broad theme covering **Preparation, Characterization and Application of EMs** allows everyone to pick up where we left off in 2019. 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: € 200.- everyone, paid on spot.

Passports and visas: the visitors from most countries outside EU need valid passport and visa when entering CZ. Please contact the Czech Embassy or consulate in your country for more information (CZ is a part of Schengen territory).

Registration: registration of participants after this date will take place at the University Hall:

April 5 th	3:00PM - 6:00 PM	<u>with welcome snack at the University Hall</u>
April 6 th	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. ~ \$180; €140) printed version and 500.- CZK (i. e. ~\$ 25, € 20) electronic 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 <https://www.ntrem.com> for updates

Chairman of the Seminar:

Prof. Svatopluk Zeman *University of Pardubice, Czechia*

Chairman of the Scientific Committee:

Prof. Adam Cumming *University of Edinburgh, United Kingdom.*

Members of the Scientific Committee:

Dr. Manfred A. Bohn *Fraunhofer ICT, Pfinztal, Germany*
Prof. José A. Campos *University of Coimbra, Portugal*
Dr. David Chavez *Los Alamos National Laboratory, NM, USA*
Dr. Ruth Doherty *Energetic Technologic Center, Indian Head, Maryland, USA*
Prof. Michael Gozin *University of Tel Aviv, Israel*
Prof. Thomas Klapoetke *Ludwig-Maximilians-Universität München, Germany*
Prof. Pavel Konečný *University of Defence, Brno, Czechia*
Prof. Michel Lefebvre *Royal Military Academy, Belgium*
Prof. Jimmie Oxley *University of Rhode Island, Kingston, USA*
Prof. Andrzej Paplinski *Military University of Technology, Warsaw, Poland*
Dr. William Proud *Imperial College London, United Kingdom*
Prof. Karl Rink *University of Idaho, USA*
Prof. Traian Rotariu *Military Technical Academy, Bucharest, Romania*
Prof. Muhamed Sućeska *University of Zagreb, Zagreb, Croatia*
Prof. Waldemar A. Trzeciński *Military University Technol., Warsaw, Poland*
Prof. Abbaraju Venkataraman *Gulbarga University, Kalaburagi, India*

Organizing Committee

Chairman of the Committee:

Assoc. Prof. Jiří Pachman *IEM, FCT, University of Pardubice*

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Organizing committee of NTREM:

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Affiliated activities:

The first meeting of the **SCIENTIFIC COMMITTEE** will be carried out on Tuesday, **April 5th, 2022**, at 6 p.m. in **Archies grill&bar** (see on page 14) the second one on Thursday, **April 7th, 2022**, at 16:30 in the University Hall.

A friendly get-together for NTREM participants will be carried out on Thursday, April 7th, 2022 at 18:00 in **Dům Techniky** at náměstí Republiky (*House of Technology at the Square of the Republic - there, where the Town Theatre is – see map at page 14*).

Lecture program of the 24th NTREM – Wednesday April 6th

08:00 Meeting of all speakers of the first Session with Chairman of this Session

08:10 Opening of seminar

08:20 Organizing Committee notes - Assoc. Prof. Jiri Pachman

1. Session

Chairman: Dr. Ruth Doherty
Energetic Technologic Center, Indian Head, Maryland, USA

- 08:30 **Sinead O'Brien**, Dr William Proud
Imperial College London, London, United Kingdom
Predicting the technology readiness level of NTREM papers.....*Proceedings p. 155*
- 08:50 **Allen Garcia**, Connor O’Ryan, Gaurav Kumar, Peter W. Chung
University of Maryland, College Park, MD, USA
Quantitative properties through semantic learning.*Proceedings p. 68*
- 09:10 **Connor O’Ryan**, Peter W. Chung, Ian Michel-Tyler, John Fischer, Ruth Do
University of Maryland, College Park, United States
Development of an automated approach for chemical synthesis knowledge graphs directly from text corpora.....*Proceedings p. 177*
- 09:30 **Liam Sullivan**, Ruth Tunnell, David Tod, Nigel Rutter
QinetiQ, England, United Kingdom
Progress towards defining the UK methodology for the stability testing of energetic materials
..... *Proceedings p. 202*
- 09:50 **Mailys Fournier**, Brigitte Defoort, Raphaël Terreux
Ariane Group, Saint-Médard-en-Jalles, France
In silico mutagenicity prediction by similarity search and machine learning algorithm: Optimisation and validation of the method for High Energetic Materials.....*Proceedings p. 51*
- 10:10 – 10:30 COFFEE BREAK**
- 10:30 **Monica C. Chandwani**, Colin R. Pulham, Carole A. Morrison, Rajen B. Patel
University of Edinburgh, Edinburgh, United Kingdom
Preparation and stabilisation of amorphous energetic materials.....*Proceedings p. 91*
- 10:50 **Michael O’Donnell**
University of Cambridge, Cambridge, United Kingdom
Additive manufacture of energetic materials: assessing the printability of energetic composites
..... *Proceedings p. 168*
- 11:10 **Lisette R. Warren**, Jack Tait, Aaron Rowell, Patrick McMaster, Colin R. Pulham, Carole A. Morrison
University of Edinburgh, Edinburgh, United Kingdom
A computational study of ballistic modifiers in the fizz reaction zone of double base propellants
.....*Proceedings p. 221*
- 11:30 **Thomas de Prinse**, Thomas Slattery, Jillian Moffatt, Thomas Payten, Georgios Tsiminis, Elizaveta Klantsataya, Tak W. Kee, Nigel A. Spooner
The University of Adelaide, Adelaide, Australia
Multiphoton excitation for standoff detection of fuels in plastic containers.....*Proceedings p. 192*

11:50 - 14:00 LUNCH BREAK

Lecture program of the 24th NTREM - Wednesday April 6th

2. Session

Chairman: Prof. Michel Lefebvre
Royal Military Academy, Brussels

13:50 **Meeting of all speakers** of the second Session with Chairman of this Session.

14:00 **Nurunnisa Atceken**, Jack Hemingway, Adam A. L. Michalchuck, Carole A. Morrison, Colin R. Pulham
Izmir Institute of Technology, Izmir, Turkey
Structure-property relationships for multi-component crystals of nitropyrazoles.....Proceedings p. 8.

14:20 **Akachai Khumsri**, Stuart R. Kennedy, Gary S. Nichol, David M. Williamson, Colin R. Pulham
University of Edinburgh, Edinburgh, United Kingdom
Tailoring the properties of FOX-7 using co-crystallisation.....Proceedings p. 105

14:40 **Moritz Kofen**, Marcus Lommel, Jörg Stierstorfer, Thomas M. Klapötke
Ludwig-Maximilian University of Munich, Munich, Germany
Adjustability of energetic coordination compounds: comparison of three 1-(azidoalkyl)-5H-tetrazole ligands and their energetic coordination compounds.....Proceedings p. 114

15:00 – 15:20 COFFEE BREAK

15:20 **Maximilian Benz**, Thomas M. Klapötke, Jörg Stierstorfer
Ludwig-Maximilian University of Munich, Munich, Germany
Energetic functionalization of 2,5-diaminotetrazole.....Proceedings p. 19

15:40 **Lukas Bauer**, Maximilian Benz, Thomas M. Klapötke, Cedric Pignot, Jörg Stierstorfer
Ludwig-Maximilian University of Munich, Munich, Germany
The structural combination of TKX-50 and MAD-X1: synthesis and characterization of 5-(3-Nitro-1,2,4-triazol-1-yl-5-yl)-tetrazol-1-ol.....Proceedings p.278

16:00 **Patrick Lieber**
Fraunhofer Institut für Chemische Technologie (ICT), Pfinztal, Germany
Continuous-flow synthesis of dichloroglyoxime.....Proceedings p. 141

Lecture program of the 24th NTREM – Thursday April 7th

3. Session

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

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

08:30 **Imogen L. Christopher**, Adam A. L. Michalchuck, Carole A. Morrison, Colin R. Pulham
University of Edinburgh, Edinburgh, United Kingdom

The impact of polymorphism on impact sensitivity - a computational study*Proceedings p. 97*

08:50 **Tobias Lenz**, Thomas M. Klapötke, Jörg Stierstorfer, Moritz Mühlemann, Guillaume Lemarchand, Ralf Weber
Ludwig-Maximilian University of Munich, Munich, Germany

Impact and friction sensitivity of acidic PETN.....*Proceedings p. 142*

09:10 **Stefan de Koster**, Hayleigh Lloyd, Sandra Blaak, Antoine van der Heijden, Denise Meuken
TNO, The Hague, The Netherlands

Ultrasound-induced damage in high solid load polymer-bonded explosives.....*Proceedings p. 119*

09:30 **Kieran Heal**, David M. Williamson

SMF Group, Cavendish Laboratory, Cambridge University, Cambridge, United Kingdom

Time-temperature superposition applied to PBX damage evolution.....*Proceedings p. 83*

09:50 – 10:10 COFFEE BREAK

10:10 **Alexander G. Harter**, Jasmin T. Lechner, Thomas M. Klapötke, Jörg Stierstorfer
Ludwig-Maximilian University of Munich, Munich, Germany

Kinetic predictions concerning the long-term stability of TKX-50.....*Proceedings p. 78*

10:30 **Mateusz Polisz**, Agnieszka Stolarczyk, Tomasz Jarosz
Institute of Industrial Organic Chemistry, Warsaw, Poland

Effect of the fuel used on the burning mechanism of nanothermite compositions.....*Proceedings p. 185*

10:50 **James Edgeley**, Christopher Braithwaite
University of Cambridge, Cambridge, United Kingdom

Development of capacitive sensors for the study of detonation.....*Proceedings p. 41*

11:10 **Sabrina Wahler** Thomas M. Klapötke
Ludwig-Maximilian University of Munich, Munich, Germany

Research output software for energetic materials based on observational modelling (RoseBoom©).....*Proceedings p. 110*

11:30 PHOTOGRAPHY IN UNIVERSITY HALL

12:00 - 14:00 LUNCH BREAK

4. Session – Poster program – see on page 9

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

Lecture program of the 24th NTREM – Friday April 8th

5. Session

Chairman: Prof. Adam Cumming
University Edingburgh, United Kingdom

- 09:00 **Dimitris Kyprianou**, Grzegorz Rarata, Michael Berglund, Giovanni Emma, Gabriela Diaconu,
David Anderson
European Commission, Joint Research Centre, Belgium,
Synthesis of energetic materials using flow chemistry.....*Proceedings p. 118*
- 09:25 **Julien Le Clanche**, Martin Monloubou, Steven Kerampran
IRDL, Brest, France
Evaluation of thermal diffusivity of solid propellants by flash method.....*Proceedings p. 135*
- 09:50 **Manfred A. Bohn**, Michael J. Herrmann,
Fraunhofer Institut für Chemische Technologie (ICT), Pfinztal, Germany
Effect of mechanical impact on PBX disk investigated by DMA.....*Proceedings p. 24*

10:05 – 10:25 **COFFEE BREAK**

10:25 – 11:30 **CLOSING REMARKS INCLUDING AWARDING OF PRIZES**

Poster program of the 24th NTREM – Thursday April 7th

6. Session

Chairman: Prof. Traian Rotariu
Military Technical Academy, Bucharest, Romania

Posters should be hung on **Wednesday, April 6th** before 14:00. Special poster sessions will take place on **Thursday (April 7th)** from 14:00 up to 16:30 h. During this time authors should be present for discussion at the posters.

- P.1 Shaikha Al Darmaki**, Jovica Bogdanov, Danica M. Bajić
Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia
Optimization of thermobaric explosives formulations by numerical modeling of detonation *Proc. p.240*
- P.2 Danica M. Bajić**, Shaikha Al Darmaki
Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia
Boron-based thermobaric explosive computational modeling and possible optimization paths.....*Proceedings p.270*
- P.3 Salama Alheara**, Danica M. Bajić
University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia
Application of thermochemical computer code in the prediction of nano-scale nitramines performance*Proceedings p. 249*
- P.4 Monica Puerto**, Mason Kellett, Rodanthi Nikopoulou, Mark D. Fuge, Ruth Doherty, Peter W. Chung, Zois Boukouvalas
American University, Washington, DC, DC, USA
Assessing the trade-off between prediction accuracy and interpretability for topic modeling on energetic materials corpora*Proceedings p. 493*
- P.5 Jack Hemingway**, Colin R. Pulham, Peter Portius, Carole A. Morrison
University of Edinburgh, Edinburgh, United Kingdom
Predicting the impact sensitivity of two possible lead azide replacements.....*Proceedings p. 338*
- P.6 Jasmin T. Lechner**, Alexander G. Harter, Thomas M. Klapötke, Jörg Stierstorfer
Ludwig-Maximilian University of Munich, Munich, Germany
Comparing long-term stability predictions of commonly known secondary explosives.....*Proceedings p. 412*
- P.7 Kivanc Aydincağ**
Roketsan Missiles Inc., Ankara, Turkey
In-situ characterization of solvent mediated cocrystallization of HNIW/HMX.....*Proceedings p. 259*
- P.8 Szymon Boroński**, Mateusz Szala, Waldemar A. Trzciniński
Military University of Technology, Warsaw, Poland
Energetic azoxy compounds as crystallization modifiers in melt-cast explosives.....*Proceedings p. 291*
- P.9 Michael J. Herrmann**, Ulrich Förter-Barth, Thomas Heintz
Fraunhofer Institut für Chemische Technologie (ICT), Pfinztal, Germany
Melt crystallization of ammonium dinitramide suspensions with additives investigated by means of X-ray diffraction.....*Proceedings p. 346*
- P.10 Radovan Skácel**, Jan Šabach, Markéta Zikmundová, Veronika Kožená, Martin Kubíček
Explosia, Inc., Pardubice, Czechia
Reduced sensitivity RDX and HMX crystallized and spheroidized in propylene carbonate..*Proc. p.553*
- P.11 Edmund Morris**, Colin R. Pulham, Patrick McMaster, Carole A. Morrison
University of Edinburgh, Edinburgh, United Kingdom
Towards a crystal structure for nitrocellulose*Proceedings p. 435*

- P.12 Ligia Radulescu**
Fraunhofer Institut für Chemische Technologie (ICT), Pfinztal, Germany
Behavior of ADN-prills in microfluidic emulsion crystallization process.....Proceedings p. 502
- P.13 Shannon E. Creegan**, Davin G. Piercey, Matthias Zeller, Edward F. C. Byrd
Purdue University, West Lafayette, IN, USA
Synthesis, characterization, and functional group substitution of energetic triazines.....Proc. p. 297
- P.14 Simon M. J. Endraß**, Thomas M. Klapötke, Jörg Stierstorfer
Ludwig-Maximilian University of Munich, Munich, Germany
Trinitro-Orcinol (C₇H₅N₃O₈) as anion in energetic metal compounds.....Proceedings p. 311
- P.15 Mateusz Gratzke**, Konrad Skrobisz
Military University of Technology, Warsaw, Poland
Direct alkylation of nitroguanidine by reaction with alkylamines – investigation of reactivity and optimization.....Proceedings p. 324
- P.16 Mantas Jonušis**, Jelena Tamuliene, Jonas Šarlauskas
Vilnius University, Institute of Biochemistry, Vilnius, Lithuania
Preparation and properties of some polynitroaromatic compounds containing nitroamino groups.....Proceedings p. 372
- P.17 Miroslav Labaj**, Lukáš Marek, Zdeněk Jalový
The University of Pardubice, Czechia
Synthesis of 1,3-bis(2-nitroxyethyl)-1-nitrourea and 1,3-bis(2-nitroxyethyl)-1,3-dinitrourea.Proc. p. 407
- P.18 Marcus Lommel**, Thomas M. Klapötke, Jörg Stierstorfer
Ludwig-Maximilian University of Munich, Munich, Germany
Structural clarification and characterization of a metal-free primary explosive based on 4-amino-2,3,6-trinitrophenol.....Proceedings p. 420
- P.19 Veerabhadragouda B. Patil**, Petr Bělina, Svatopluk Zeman
The University of Pardubice, Czechia
Synthesis and emphasized study of TATB/nitramines cocrystals via coagglomeration method.....Proceedings p. 469
- P.20 Alexander Schweiger**, Jörg Stierstorfer, Thomas M. Klapötke
Ludwig-Maximilian University of Munich, Munich, Germany
Lithium 2,2,2-trinitroethyl nitrocarbamate monohydrate as colorant in red-burning pyrotechnics.....Proceedings p. 547
- P.21 Michael Voggenreiter**, Jörg Stierstorfer, Thomas M. Klapötke, Ivan Gospodinov, Thomas Fess
Ludwig-Maximilian University of Munich, Munich, Germany
Oxetan-3-one as promising building block for energetic monomersProceedings p. 574
- P.22 Dominique R. Wozniak**, Ben Salfer, Matthias Zeller, Edward F. C. Byrd, Davin G. Piercey
Purdue University, West Lafayette, IN, USA
Tunable energetic materials from 4-nitro-1,2,3-triazole.....Proceedings p. 579
- P.23 Markus Rösch**, Jörg Stierstorfer, Thomas M. Klapötke
Ludwig-Maximilian University of Munich, Munich, Germany
Comparison of 1-vinyl 5H-tetrazole and 1-allyl-5H-tetrazole as ligands in energetic transition metal complexesProceedings p. 522
- P.24 Elena Reinhardt**, Tobias Lenz, Jörg Stierstorfer, Thomas M. Klapötke
Ludwig-Maximilian University of Munich, Munich, Germany
Evaluation of nitropyrazole based nitrate esters as melt-castable energetic materialsProc. p.507
- P.25 Christian Riedelsheimer**, Thomas M. Klapötke, Burkhard Krumm
Ludwig-Maximilian University of Munich, Munich, Germany
Spectroscopic, structural and energetic properties of pentanitroaniline.....Proceedings p. 513
- P.26 Barbara Štimac** Tumara, Muhamed Sućeska, Siniša Stanković, Vinko Škrlec
Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb, Croatia
Prediction of ANFO's charge diameter effect on detonation parameters using hydrodynamic and thermochemical codes.....Proceedings p. 559

- P.27 **Vječislav Bohanek**, Mario Dobrilović, Philipp Hartlieb, Bartul Marunić
Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb, Croatia
Influence of diameter of explosive charge and thickness of steel confinement on detonation velocity of ANFO explosives.....*Proceedings p. 285*
- P.28 **Francis Halleux**, Jean-François Pons, Ian Wilson, Romuald Van Riet, Bart Simoens, Michel Lefebvre
Cranfield University, Shrivenham, United Kingdom
Detonation performance of urea hydrogen peroxide.....*Proceedings p. 333*
- P.29 **Jakub Selesovsky**, Jiri Pachman, Jindrich Kucera
The University of Pardubice, Czech Republic
Cylinder test of emulsion explosives: possibilities of detonation pressure estimation...Proceedings p. 541
- P.30 **Jindrich Kucera**, Jan Matl, Jiri Pachman
OZM Research, Hrochuv Tynec, Czechia
Modern method for crater volume evaluation.....*Proceedings p. 387*
- P.31 **Martin Künzel**, Jindrich Kucera, Karel Kubat
OZM Research, Hrochuv Tynec, Czechia
Tracking acceleration of projectiles using Photonic Doppler Velocimetry.....*Proceedings p. 393*
- P.32 **Martin Künzel**, Jindrich Kucera, Jiri Pachman
OZM Research, Hrochuv Tynec, Czechia
OPTIMEX: First attempts in detonation temperature measurements..... *Proceedings p. 399*
- P.33 **Florin M. Dîrloman**, Traian Rotariu, Gabriela Toader, Bogdan G. Pulpea, Mihai I. Ungureanu, Neculai D. Zvincu, Adrian N. Rotariu, Liviu C. Matache
Military Technical Academy, Bucharest, Romania
Solvent free polyurethanic binders for pyrotechnic compositions,,,,,,,,,,,,,,,,,,,,,,,,,,,,,Proceedings p. 303
- P.34 **Milan Olšovský**, Milan Krištof, Petr Kuna, Šimon Budzák
ZVS Impex, Dubnica nad Váhom, Slovakia
Preparing and properties of ecological pyrotechnic compositions.....*Proceedings p. 455*
- P.35 **Cristiana Epure**, Ovidiu Iorga, Tudor V. Tiganescu, Andreea E. Moldovan, Alexandru Marin, Raluca E. Gînghină, Horia R. Botiș
Research and Innovation Center for CBRN Defense and Ecology, Bucharest, Romania
Thermal, calorimetric and morphologic characterisation of polyurethane based composite flare pyrotechnic material*Proceedings p. 318*
- P.36 **Filip Sazceck**, Ondrej Vodochodsky, Robert Matyas, Jiri Pachman .
The University of Pardubice, Czechia
Differences between sample form and it's effect on sensitivity of composite propellants containing BCHMX as a new energetic additive.....*Proceedings p. 534*
- P.37 **Laurence Jeuniau**, Bart Simoens, Romuald Van Riet, Michel Lefebvre
Royal Military Academy, Brussels, Belgium
Towards the phlegmatizing of TATP: influence of vacuum oils on its sensitivity to impact and friction.....*Proceedings p. 368*
- P.38 **Alexandru Marin**, Munteanu Mihail, Ovidiu Iorga, Tudor-Viorel Tiganescu, Șchiopu Andrei
Research and Innovation Center for CBRN Defense and Ecology, Bucharest, Romania
Burn rate, combustion heat and flame temperature measurements for metal powders and alloys used in composite energetic materials.....*Proceedings p. 318*
- P.39 **Halil İpek**, Taner Atalar, Ali Fatih Zeybek, Değer Çetin
Tübitak Sage, Ankara, Turkey
Preparation and characterization of the butacene based composite propellants.....*Proceedings p. 362*
- P.40 Traian Rotariu, **Andreea E. Moldovan**, Gabriela Toader, Sorin Eșanu, Florin M. Dîrloman, Raluca E. Gînghină, Ana M. Gavrilă
Military Technical Academy, Bucharest, Romania
PBX compositions based on high explosives and polymeric binders with adjustable water solubility.....*Proceedings p. 527*

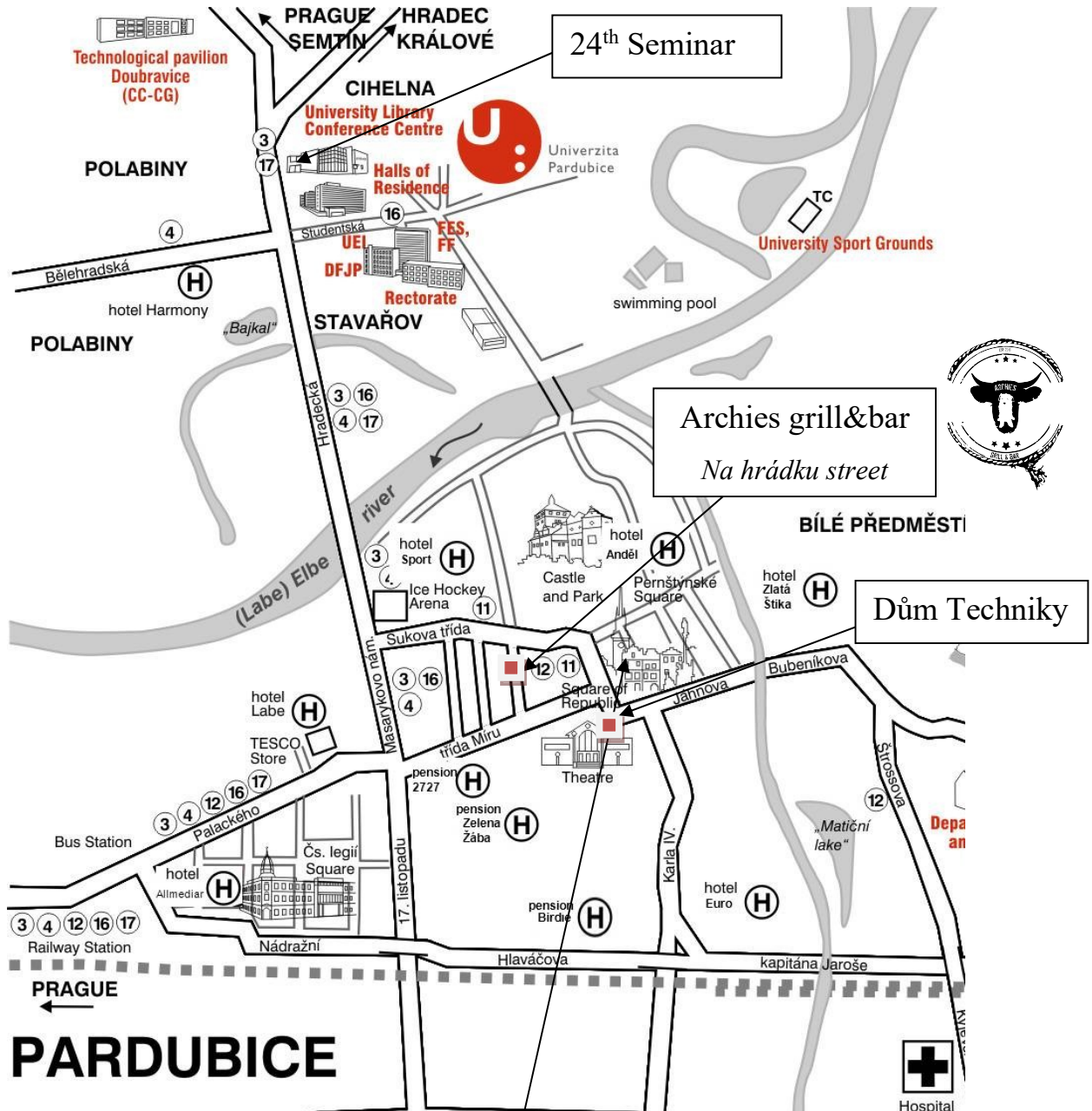
- P.41 Karol Zalewski**, Zbigniew Chyłek, Waldemar A. Trzcíński
Military University of Technology, Warsaw, Poland
In search of new commercially available bonding agents for RDX/HTPB compositions.....Proc. p. 594
- P.42 Arda Yılmaz**, Ali Fatih Zeybek, Serhat Bilgen, İnci Ecem Metin, Değer Çetin, Tarık Yücel
Tübitak Sage, Ankara, Turkey
Comparison of plastic bonded enhanced blast explosive with TNT and Comp-B in terms of thermal and blast properties.....Proceedings p. 586
- P.43 Megan Tierney**
Chemring Energetics UK, Stevenston, United Kingdom
Ballistic modification of extruded double base propellants.....Proceedings p. 568
- P.44 Paulina Paziewska**, Katarzyna Gańczyk-Specjalska, Rafał Lewczuk, Rafał Bogus
Institute of Industrial Organic Chemistry, Warsaw, Poland
The influence of Catocene on properties of heterogeneous solid rocket propellants with reduced quantity of HCl in combustion products.....Proceedings p. 483
- P.45 Michał Chmielarek**, Katarzyna Cieślak, Paweł Maksimowski
Warsaw University of Technology Faculty of Chemistry, Warsaw, Poland
The study on the crosslinking and curing of poly(glycidyl azide) (GAP)Proceedings p. 354
- P.46 Elena-Ramona Oncioiu**, Nicoleta Grigoriu, Ovidiu Iorga, Tudor-Viorel Țiganescu, Adriana-Elena Bratu, Mihail Munteanu
Research and Innovation Center for CBRN Defense and Ecology, Bucharest, Romania
The effect of accelerated ageing on the mechanical properties, chemical composition and morphostructure of a HTPB-AP-Al rocket propellant.....Proceedings p. 459
- P.47 Andreas Neuer**, Simon M. J. Endraß, Greta Bikelyte, Thomas M. Klapötke
Ludwig-Maximilian University of Munich, Munich, Germany
Experimental vapor pressures of 3,5-dihydroxy-2,4,6-trinitrotoluene (TNO) via transpiration method supported by the quantitative HPLC.....Proceedings p. 440
- P.48 Thi Van Nguyen, Quang Hieu Pham**, Quang Phat Tran, Phu Soan Le, Van Toai Pham, Phuong Thao Nguyen Thi
Institute of Propellants and Explosives, Ha Noi City, Viet Nam
Determination of camphor concentration profile in deterred single base propellant 5/7SFL.....Proceedings p.449

Evening's program of the 24th NTREM – Thursday April 07th

18:00 - 22:00 EVENING PROGRAM -A friendly get-together in the “DŪM TECHNIKY”



DŮM TECHNIKY PARDUBICE is finding in the town center next to the theatre (on the Republic square)



The old town Pardubice – Pershtein square