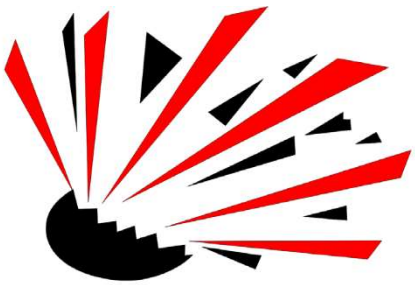
UNIVERSITY OF PARDUBICE

Faculty of Chemical Technology, Institute of Energetic Materials

PROGRAM

of the 27th seminar

NEW TRENDS IN RESEARCH OF ENERGETIC MATERIALS



NTREM 2025

Pardubice, Czech Republic, April 2nd – 4th, 2025

http://www.ntrem.com

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

27th International Seminar
"New Trends in Research of Energetic Materials"
www.ntrem.com

is supported by:

Austin Powder, Vsetin, Czech Republic

Astotec Pyrotechnic Solutions, Austria

Biazzi, Switzerland

Explosia, Pardubice, Czech Republic

Faculty of Chemical Technology, University of Pardubice, Czech Republic

MSM GROUP, S.R.O, Dubnica nad Vahom, Slovak Republic

Nicolet CZ s.r.o., Praha, Czech Republic

STV Technology a.s., Policka, Czech Republic

OZM Research, Bliznovice, Czech Republic

Sellier & Bellot, Vlasim, Czech Republic

SSE Explo, Tuchorice, Czech Republic

NTREM is an international meeting of students and early career researchers who are involved in the fundamental understanding, development, technology, industry or application of energetic materials. The seminar enables the presentation of research and allows feedback and interaction with senior,well established experts in the field. In addition, participants will meet and form networks enabling them to communicate amongst each other. It is expected that the seminar will help career progression. The Seminar is intended to provide a pleasant and welcoming atmosphere where exchange of professional experiences goes along with building of strong personal relations among young specialists working in the field of EM.

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 € paid on spot.

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

April 1th	16:00 - 18:00	with welcome snack at the University Hall
April 4th	07:30 - 09:00	

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 €) CD version – the prices are valid at the time of the seminar. The USB with Proceedings will be provided to the main authors and participants of the seminar free of charge.

Please, visit the web site www.ntrem.com for updates

Chairman of the Seminar:

Assoc. Prof. Jiri Pachman	IEM, FCT *University of Pardubice, CR*

Chairman of the Scientific Committee:

Prof. Adam Cumming	*University of Edinburgh, UK*

Members of the Scientific Committee:

Assoc. Prof. Taner Atalar	*Tubitak Sage, Turkey*
Dr. Manfred A. Bohn	*Fraunhofer ICT, Pfinztal, Germany*
Assoc. Prof. Chris Braithwaite	*University of Cambridge, UK*
Prof. Martin Braithwaite	*University of Cambridge, UK*
Prof. Jose A. Campos	*University of Coimbra, Portugal*
Dr. David Chavez	*Los Alamos National Laboratory, NM,USA*
Dr. Ruth Doherty	*Energetics Technology Center, Indian Head, Maryland, USA*
Dr. Stefan Ek	*FOI, Stockholm, Sweden*
Prof. Michael Gozin	*University of Tel Aviv, Israel*
Prof. Antoine van der Heijden	*TNO, Rijswijk, Netherlands*
Prof. Thomas Klapötke	*Ludwig-Maximilians-Universität Műnchen, Germany*
Prof. Pavel Konečný	*University of Defense, Brno, CR*
Dr. Jasmin T. Lechner	*Fraunhofer ICT, Pfinztal, Germany*
Prof. Michel Lefebvre	*Royal Military Academy, Brussels, Belgium*
Prof. Jimmie Oxley	*University of Rhode Island, Kingston, USA*
Dr. Davin Piercey	*Purdue University, West Lafayette, USA*
Dr. William Proud	*Imperial College London, United Kingdom*
Prof. Karl Rink	*University of Idaho, Moscow, USA*
Prof. Traian Rotariu	*Military Technical Academy, Bucharest, Romania*
Prof. Muhamed Sućeska	*University of Zagreb, Zagreb, Croatia*
Prof. Raphaël Terreux	*Université Claude Bernard, Lyon, France*
Prof. Waldemar A. Trzciński	*Military University Technology, Warsaw, Poland*
Prof. Abbaraju Venkataraman	*Gulbarga University, Kalaburagi, India*

Organizing Committee

Chairman of the Committee:

Dr. Marcela Jungova	*IEM, FCT, University of Pardubice, CR*

Members of the Committee:

Dr. Jakub Selesovsky	*IEM, FCT, University of Pardubice, CR*
Dr. Iva Ulbrichova	*Dean Office, FCT, University of Pardubice, CR*

Organizing committee of NTREM:

Institute of Energetic Materials
Faculty of Chemical Technology
University of Pardubice
532 10 Pardubice
CZ, European Union

Phone: (+420) 46 603 8023
E-mail: seminar@ntrem.com

Affiliated activities:

The first meeting of the scientific committee will be held on Tuesday, April 1st, 2025 at 18:00 in the "Garden Restaurant", the second one on Thursday, April 3rd, 2025 at 16:00 at the University Hall.

A friendly get-together for NTREM participants will take place on Thursday, April 3rd, 2025 at 19:30 – 22:00, in the House of Technology, Pardubice (see the last page for map).

LECTURE PROGRAM OF THE 27th NTREM – WEDNESDAY APRIL 2nd

07:30 - 09:00 **REGISTRATION**

8:20 **SEMINAR OPENING BY SCHOOL REPRESENTATIVE**

8:30 **ORGANIZATION REMARKS**

1. *Session*

Chairman: Prof. Thomas Klapötke
Ludwig-Maximilians-Universität Műnchen, Germany

MEETING OF SPEAKERS WITH CHAIRMAN

08:40 A synthetic route to 3,5-dinitropyridine analogs and evaluation of their thermal properties
Leidy Hooker *p.*

09:00 Investigations on energetic nitro substituted cubanes
Andreas Bartonek *p.*

09:20 Energetic polymers derived from oxetanes
Natasha H. Boulton *p.*

09:40 Triazol polymer, first step for a self-healing PBX
Frederick Lacemon

10:00 Synthesis and evaluation of novel TATB-inspired energetic materials
Meghan C. Benda

10:20 - 10:40 **COFFEE BREAK**

10:40 Reinvestigation of alkali and alkaline earth metal styphnate salts as components for priming compositions
Shouei Yiu *p.*

11:00 Novel explosive method for the synthesis of silver nanoparticles
Jan Maurycy Uszko *p.*

11:20 Mitigating Environmental Impact of TNT Production: Strategies for Red Water Reduction and Treatment
Lukas Bauer *p.*

11:40 Isocyanate-free energetic polymer binders
Thomas Bugnand *p.*

12:00 – 14:00 **LUNCH BREAK**

2. *Session*

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

14:00	PETN under pressure ***Heather M. Quayle***	*p.*
14:20	Optimization of fiber optic probe for measuring detonation velocity ***Stepan Jirman***	*p.*
14:40	Towards purifying polyvinyl nitrate ***Stephen Spice***	*p.*
15:00	Long term decomposition and crystallisation kinetics of ADN under some crystallographic aspects ***Peter Schultz***	*p.*
15:20 – 15:40	**COFFEE BREAK**	
15:40	Research on material model and parameters of metal thin plate under close-in explosion load ***Xing-long Li***	*p.*
16:00	Energy output of HMX-based aluminized explosives with varying aluminum (Al) and polytetrafluoroethylene (PTFE) ratios ***Wei Cao***	*p.*
16:20	LLM-105: achieving different morphologies for different properties ***Eric Pasquinet***	*p.*
16:40	**POSTER SESSION INTRODUCTION** 2 min each poster presenter	

3. *Session*

Chairman: Dr. Ruth Doherty
Energetics Technology Center, Indian Head, Maryland, USA

	MEETING OF SPEAKERS WITH CHAIRMAN	
08:40	Aluminized highly energetic materials simulation under partial chemical equilibrium assumption with HEMSim ***Yuri Caridi***	*p.*
09:00	Exploring complex potential energy landscapes of computationally modelled ballistic modifiers ***Harvey J. Newman***	*p.*
09:20	Thermal Isolation Modeling of Aluminized Energetic Materials for Low-Cost Computational Code ***Andrea Cucuzzella***	*p.*
09:40	An improved statistical analysis of 72 sensitivity datasets ***Dennis Christensen***	*p.*
10:00	Comparing thermal and chemical analysis of aged and unaged NC-based propellants ***Reinier de Vries***	
10:20 – 10:40	**COFFEE BREAK**	
10:40	**2 MINUTES ORAL POSTER INTRODUCTION (2-3 SLIDES PRESENTATION)**	
11:40	**GROUP PHOTOGRAPHY**	
12:00 – 14:00	**LUNCH BREAK**	

Poster Session

Chairman: Assoc. Prof. Jiri Pachman
IEM, FCT *University of Pardubice, CR*

P1	Studies on inert surrogate for pressable plastic bonded explosives ***Ö. Güneş Ekim***	*p.*
P2	Catalyst screening for reaction of HTPB and IPDI in PBX formulations ***M. Erdurucan***	*p.*
P3	Synthesis and characterisation of the novel energet ***B. Westwater***	*p.*
P4	Molecular simulation of reaction mechanisms and transition states ***A. Omlor***	*p.*
P5	Enhancing the rheological and processing properties of PBX explosives containing boron through surface modifications and compatibilization with the binder ***D. Bajić***	*p.*
P6	Study on the influence of material properties and explosive quantities on the formation of Explosively Formed Projectiles (EFP) ***I. Păcurar***	*p.*
P7	Measuring powder flow parameters of inert simulants for 3D printing explosives ***R. Al-Dhaheri***	*p.*
P8	The synthesis and characterization of energetic materials containing both a tetrazole and a strained ring moiety ***J. Zuckerman***	*p.*
P9	Microwave synthesis of triethylene glycol diazide (TEGDA): Advanced approaches and characterization ***J. T. Lechner***	*p.*
P10	Numerical and experimental analysis of Semtex 1A blast wave parameters ***R. Fosse***	*p.*
P11	Investigating the effect of graphene / graphene oxide on the crystallization and polymorphic stability of ammonium nitrate ***F. Alhosani***	*p.*
P12	Calorimetric bomb test as a method for the selection of optimal boron powder for pyrotechnic applications ***M. Krstović***	*p.*
P13	The danger related to the use of ammunition and explosives ***J. Rećko***	*p.*
P14	Comparative analysis of the ESD sensitivity of B/KNO3 and B4C/KNO3 pyrotechnic compositions ***P. Hřebíčková***	*p.*

P31	Numerical study regarding the functioning of solid rocket motor using 3d printed grain ***A. M. Braic***	*p.*
P32	High-speed visualization and piezosensor monitoring of shocktube reaction propagation ***M. Kreisl***	*p.*
P33	Replacement of RDX by TKX-50 in a plastic bonded explosive based on Viton A ***A. A. Helmy***	*p.*
P34	Study on performance and safety characteristics of multilayer composite propellants ***I. Dan***	*p.*
P35	Effects of the explosion-generated plasma on the ammunition shell ***Z. Bajić***	*p.*
P36	Measurement of a single fragment's velocity by using a controlled fragmentation method ***M. Tagawa***	*p.*
P37	Effect of 3D printed shaped charge liner on the effectiveness of shaped charges ***M. Bilina***	*p.*
P38	New smoke formulations based on copper (II) phthalocyanine ***A. Schweiger***	*p.*
P39	Rocket motor insulation – different fillers and their effect on rheological behavior and internal structure ***D. Fromm***	*p.*
P40	Lead oxide(II, IV) replacement in gasless pyrotechnic time delay compositions ***M. Gerlich***	*p.*
P41	IEM research labs at the start to safety 2.0 ***M. Vitík***	*p.*
16:30	**SCIENTIFIC COMMITTEE MEETING AT LECTURE HALL**	
18:30	**SOCIAL EVENT - BANQUET AT HOUSE OF TECHNOLOGY**	

4. *Session*

Chairman: Prof. Adam Cumming
(University of Edinburgh, UK)

	MEETING OF SPEAKERS WITH CHAIRMAN	
08:50	Modelling complex ageing behavior of tensile modulus in CTPB-bonded propellant – parametric and kinetically based procedures ***Manfred Bohn***	*p.*
09:20	New green solvents for high dissolution and the mechanism of strongly hydrogen-bonded explosives ***Jianbo Chen***	*p.*
09:40	Construction of a composite surface coating layer with high efficiency on desensitization of HMX ***Shuyi Duan***	*p.*
10:00	Synthesis and characterisation of the energetic plasticiser Bu-AENA ***Stefan Ek***	*p.*
10:20 – 10:40	**COFFEE BREAK**	
10:40	An overview of vibration effects on energetic materials ***Maurício Ferrapontoff Lemos***	*p.*
11:00	Some issues of hydroxyl derivatives of ferrocene as burning rate modifiers of composite propellants ***Tomasz Sałaciński***	*p.*
11:20	BKNO3 pyrotechnic igniters for SRM: analysis of performance dispersion from development to production ***Barbara Betti***	*p.*
12:00	**PRIZE AWARDS & CLOSING THE SEMINAR**	

1

MAIN VENUE
UNIVERSITY HALL

(Aula Arnošta z Pardubic)

Studentská 519, Pardubice

https://mapy.cz/s/larunemona

50.0496653N, 15.7665203E

2

BANQUET
HOUSE OF TECHNOLOGY

(Dům Techniky)

Náměstí Republiky 2686, Pardubice

https://mapy.cz/s/hebuvenade

50.0372314N, 15.7770425E

3

PARKING HOUSE
IN TOWN

Parkovací dům

Karla IV. 2749, Pardubice

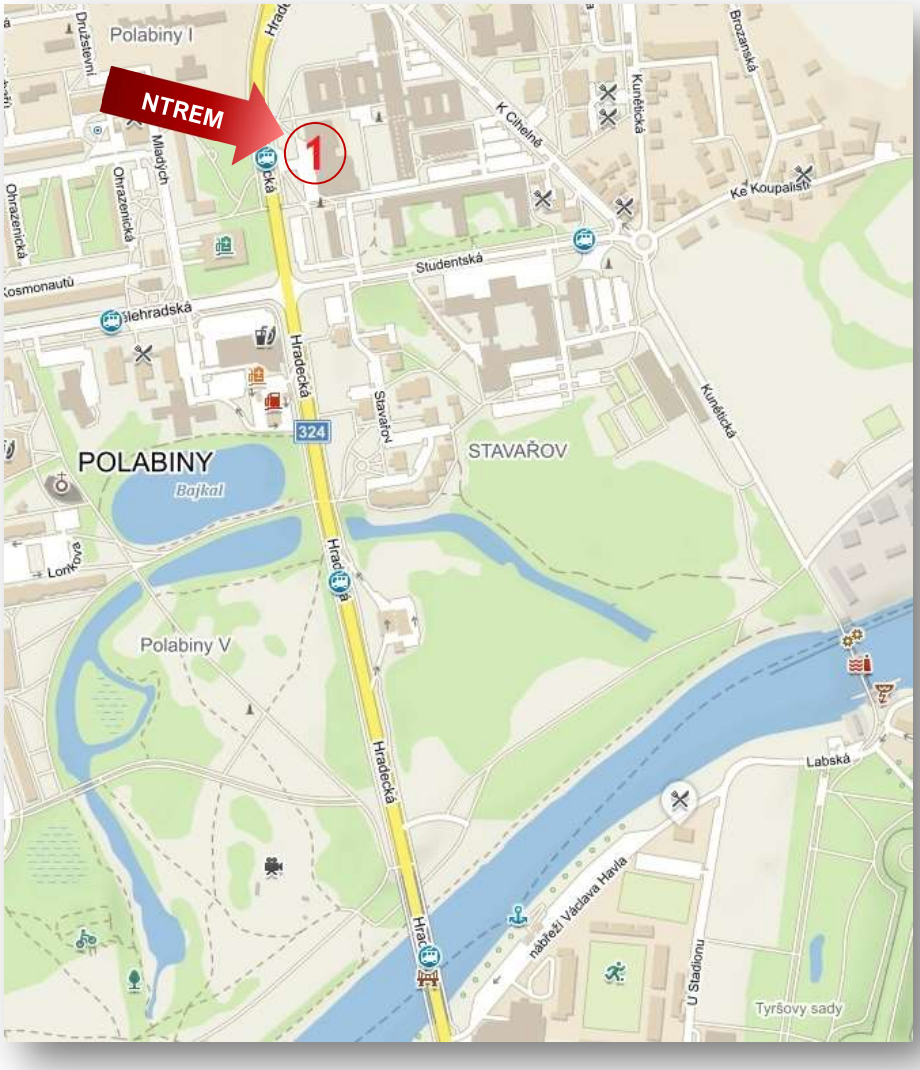
https://mapy.cz/s/muzekacore

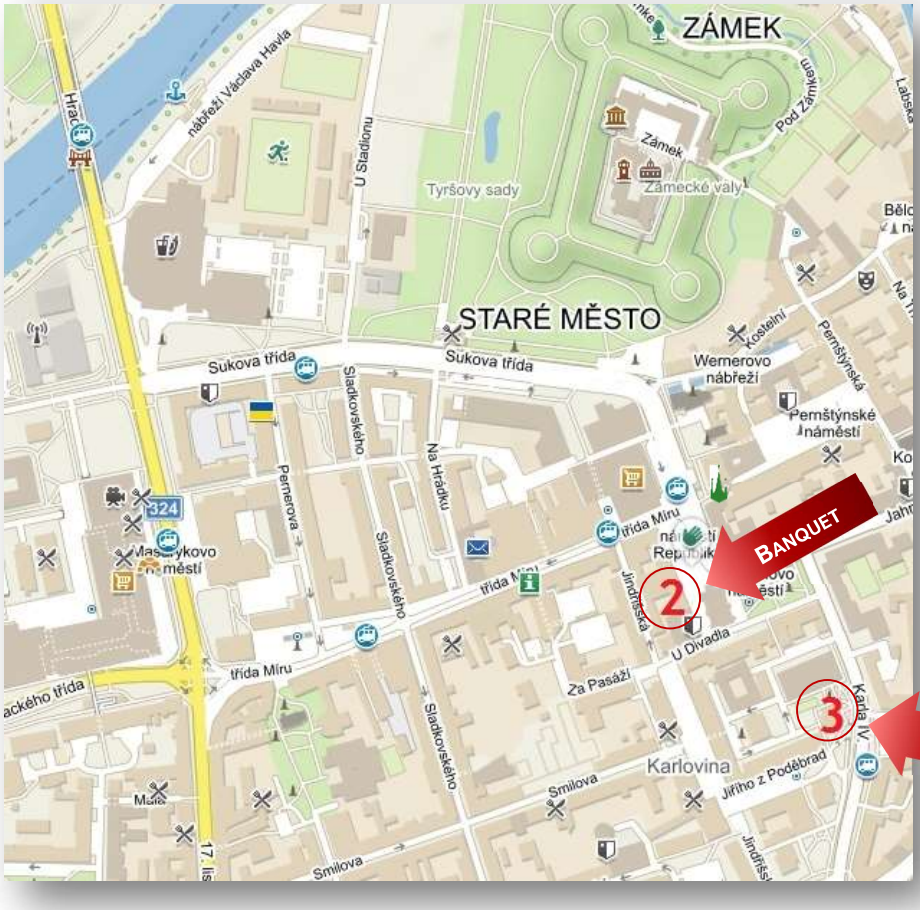
50.0362419N, 15.7793439E

Bus or Trolleybus - more info at www.dpmp.cz

From the Main Train Station to University Hall – line 3, 17, 33 (Polabiny Hradecká – stop No. 6)

From the Main Train Station to House of Technology – line 6, 8, 9, 12 (Náměstí Republiky – stop No. 4)


NTREM
1
Polabiny I
Družstevní
Mladých
Ohrazenická
Hradecká
K Cihelně
Kunětická
Brozanská
Ke Koupališti
Studentská
Slehradská
324
POLABINY
Bajkal
STAVAŘOV
Stavařov
Lomková
Polabiny V
Labská
nábřeží Václava Havla
U Stadionu
Tyršovy sady


ZÁMEK
Zámek
Zámecké valy
Pod Zámkem
Tyršovy sady
STARÉ MĚSTO
Sukova třída
Wernerovo nábřeží
Pernštýnské náměstí
Pernštýnská
Kostelní
Sladkovského
Pernerova
Na Hrádku
třída Míru
Jindřišská
U Divadla
Za Pasáží
Karla IV.
Karlovina
Jiřího z Poděbrad
Smilova
BANQUET
2
3
PARKING