

Program

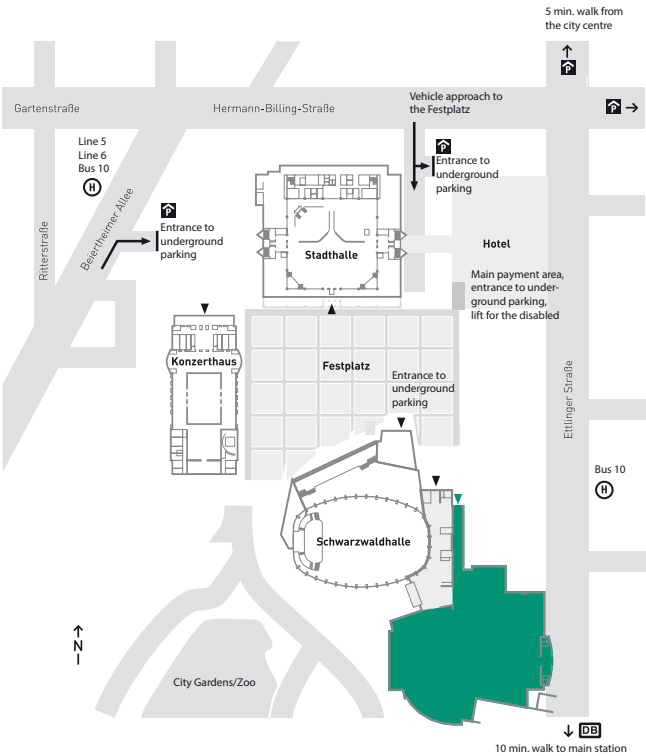
# Energetic Materials – Analysis, Characterization, Modelling

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52<sup>nd</sup> International Annual Conference  
of the Fraunhofer ICT

June 27-30, 2023  
Convention Center, Gartenhalle  
Karlsruhe, Germany

# How to find the venue



Karlsruhe is located 120 km south of Frankfurt (Main)/Frankfurt International Airport just beside the Autobahn A5, and is also connected to Frankfurt via the Intercity Express Train ICE.

Additional airports are: Strasbourg (F) (approx. 100 km) and Stuttgart (D) (approx. 90 km)

By car: from all directions, follow traffic signs to “Kongresszentrum”

Congress Center Karlsruhe  
Festplatz 9  
76137 Karlsruhe  
Germany

International Annual Conferences of the Fraunhofer ICT, with a different emphasis each year, cover scientific and technological progress in the entire field of energetic materials and the related disciplines. Held annually for over 50 years, the conferences have gained worldwide importance, with hundreds of participants from more than 30 nations each year.

## **Energetic Materials – Analysis, Characterization, Modelling**

Research into energetic materials is more relevant than ever and has been the focus of the ICT Annual Conference for more than 50 years. New research results, developments, applications and trends in the field of energetic materials have continually been presented, discussed and debated by the international research-community. Many long-standing research goals are still relevant, such as increased performance and safety. However, there are also new aspects such as reducing the environmental and health hazards of the energetic materials and the resulting reaction products. In addition to the synthesis and production of new, high-performance energetic materials and additive manufacturing, these goals and requirements lead to the development of new and advanced methods in analysis, characterization and modelling. The spectrum ranges from online measurement techniques, and fast spectroscopic methods, through to analytical or even complex numerical models and simulations. The overall aim is to gain a better understanding of the processes and materials being investigated and to identify the factors influencing their behavior, allowing performance predictions or the development of new applications.

The 52<sup>nd</sup> International ICT Annual Conference invites scientists, engineers and everyone who works with, develops and applies energetic materials to present their ideas, developments and results, to stimulate fruitful discussions leading to improvements and new developments of materials, methods and models.

Chairman of the Conference  
Sebastian Knapp  
Fraunhofer ICT, Pfinztal, Germany

# General Information

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## Registration

- Register online: [www.ict.fraunhofer.de/jata2023](http://www.ict.fraunhofer.de/jata2023)
- Registration fee (incl. proceedings, coffee breaks, lunch): € 900,--
- Participation cannot be guaranteed for registrations arriving after June 16<sup>th</sup>, 2023. The fee has to be paid upon receipt of the invoice by bank transfer.

## Cancellation Policy

- € 500,-- will be charged for cancellations after June 20<sup>th</sup>, 2023. No-shows will be charged the whole fee.

## Accommodation

- Online, see [www.ict.fraunhofer.de/annualConference](http://www.ict.fraunhofer.de/annualConference)

## Conference Office

- Foyer of the GARTENHALLE
- Open from Tuesday, June 27, 16.00 h till Friday, June 30, 14.00 h during the Conference and may be reached by Phone +49-(0)7 21 / 37 20 - 6000

## Check in / Welcome Reception

- Please check in at the Conference Office on Tuesday, June 27, between 16.00 and 20.00 h.
- All participants are cordially invited to the Welcome Reception on the same day, starting at 18.00 h in the foyer of the GARTENHALLE.

## Conference Language

- English

## Get-together and Tours of the Institute (Thursday, June 29)

- The Fraunhofer ICT can be visited on Thursday, June 29 in the evening. There will be several short tours of the Institute, accompanied by a Get-together Party with draught beer, barbecue and fireworks (after sunset). Please mark on your registration form whether you wish to participate.
- Transportation: Bus shuttle Convention Centre Karlsruhe – Fraunhofer ICT and back

# Wednesday, June 28

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09.00 **WELCOME AND OPENING**

S. Wilker  
BAAINBw, Koblenz, D  
S. Knapp  
Fraunhofer ICT, Pfinztal, D

**1<sup>st</sup> Session: GUN AND ROCKET PROPELLANTS**

Chair: S. Wilker  
BAAINBw, Koblenz, D  
Co-Chair: S. Sims, Fraunhofer ICT

09.20 **V1 MODELING AND SIMULATING THE SURFACE REGRESSION OF HETEROGENEOUS SOLID PROPELLANTS COMBUSTION IN CLOSED VESSELS**

M. Lietz  
Fraunhofer ICT, Pfinztal, D

09.40 **V2 MICROENCAPSULATED GUN PROPELLANTS BY INTERFACIAL POLYMERIZATION**

D. Bird, N. Peabody, C. Houthuysen, J. Bolognini,  
E. Caravaca, K. Juckett, B. Sukennikoff, Z. Yauch,  
R. Nuggehalli  
US Army DEVCOM, Picatinny Arsenal, USA

10.00 **V3 POLYMERIC NETWORKS FOR SOLID PROPELLANTS INSENSITIVE TO MOISTURE**

Byoung Sun Min, Chang Kee Kim, Hong Min Shim,  
Sung June Kim, Jinhyuk Lee  
Agency for Defense Development, ROK

10.20 **V4** **THERMAL DECOMPOSITION KINETICS OF SURFACE MODIFIED AMMONIUM PERCHLORATE WITH GREEN IRON OXIDE NITROCELLULOSE NANOCOMPOSITE**

M. Nourine, M.K. Boulkadid, S. Toudjine, H. Akbi,  
S. Belkhiri  
Ecole Militaire Polytechnique (EMP), Algiers, ALG

10.40 Coffee break

**2<sup>nd</sup> Session: PYROTECHNICS**

Chair: V. Weiser

Fraunhofer ICT, Pfinztal, D

Co-Chair: P. Pietrek, Fraunhofer ICT

11.10 **V5** **EXPERIMENTAL STUDY ON IMPACT-INDUCED REACTIVE MATERIAL FRAGMENTS BASED ON FLUOROPOLYMERS FABRICATED USING ALTERNATIVE METHODS**

H.J. Lloyd, D.B. Meuken, M. Zebregs, G. Boone,  
R.H.B. Bouma  
TNO, Rijswijk, NL

11.30 **V6** **CHARACTERIZATION OF PRESSURE OUTPUT IN PYROTECHNIC DELAYS**

M. Motyka  
US Army DEVCOM, Picatinny Arsenal, USA

11.50 **V7** **RADIOMETRY AND SPECTROSCOPY OF RED PHOSPHORUS COMBUSTION FLAMES**

E.-C. Koch  
Lutradyn Energetic Materials, Kaiserslautern, D  
V. Weiser, E. Roth  
Fraunhofer ICT, Pfinztal, D

12.10 **Lunch break**

Wednesday, June 28

**3<sup>rd</sup> Session: MANUFACTURING**

Chair: H. Östmark

FOI, Stockholm, SE

Co-Chair: L. Radulescu, Fraunhofer ICT

- 14.00 **V8** **ENGINEERED POROUS PROPELLANTS USING ADDITIVELY MANUFACTURING**  
E. Caravaca  
US Army DEVCOM, Picatinny Arsenal, USA
- 14.20 **V9** **ADDITIVE MANUFACTURING OF GUN PROPELLANTS BASED ON GAP-ETPE BY MATERIAL EXTRUSION**  
D. Mitro, A. Dresel, J. Böhnlein-Mauß  
Fraunhofer ICT, Pfinztal, D
- 14.40 **V10** **SUBMICRON-SIZED SILVER AZIDE SYNTHESIS BY SPRAY FLASH SYNTHESIS**  
G. Galland, M. Comet, A.K. Ott, F. Schnell,  
B. Lallemand, B. Bonnet, D. Spitzer  
ISL, Saint-Louis Cedex, F
- 15.00 **Coffee break**

**4<sup>th</sup> Session: SYNTHESIS**

Chair: E.-C. Koch

Lutradyn, Kaiserslautern, D

Co-Chair: I. Wilhelm, Fraunhofer ICT

- 15.30 **V11** **SYNTHESIS AND CHARACTERIZATION OF A PROMISING ENERGETIC POLYSACCHARIDE DERIVED FROM CHITOSAN FOR POTENTIAL APPLICATION IN ADVANCED ENERGETIC FORMULATIONS**  
A.F. Tarchoun, D. Trache, A. Abdelaziz,  
M.A. Hamouche, H. Boukeciat  
Ecole Militaire Polytechnique, Algiers, ALG



- 15.50 **V12** **INVESTIGATION OF SOME NEW NITRAZAPROPYL- AND TRINITRAZAHEPTYL-BRIDGED ENERGETIC MOLECULES**  
J.T. Lechner, T.M. Klapötke  
Ludwig-Maximilian-University, München, D
- 16.10 **V13** **ADVANCES IN NEW ENERGETIC MOLECULES AND HIGH NITROGEN COMPOUND CHEMISTRY**  
D. Piercey  
Purdue Energetics Research Center PERC,  
West Lafayette, USA
- 16.30 **V14** **DEVELOPMENT OF NITROGEN RICH POLYBENZOXAZINES FOR ENERGETIC APPLICATIONS**  
M. Derradji  
Ecole Militaire Polytechnique (EMP), Algiers, ALG

## Thursday, June 29

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### 5<sup>th</sup> Session: KINETICS

Chair: W. de Klerk

TNO, Rijswijk, NL

Co-Chair: M. Heil, Fraunhofer ICT

- 09.00 **V15** **REACTION RATE RULES FOR DETAILED KINETIC MODELLING OF NITRITE AND NITRATE FUNCTIONAL GROUPS**  
H. Minwegen, K.A. Heufer  
RWTH Aachen University, Aachen, D  
J. Glorian, B. Baschung  
ISL, Saint-Louis, F

Thursday, June 29

- 09.20 **V16** **THERMAL BEHAVIOR AND REACTION KINETICS OF QUATERNARY GO/AL/KCLO<sub>4</sub>/RDX NANOCOMPOSITES AS A GREEN PRIMARY EXPLOSIVE**  
A. Fahd, S. Elbasuney, S. Shokry  
Technical Research Center, Cairo, ET  
C. Dubois  
Ecole Polytechnique de Montreal, CDN  
M. Abada  
University of Idaho, USA
- 09.40 **V17** **THE REACTION KINETIC HANDLING OF COMPLEX REACTION BEHAVIOUR IN SOLID COMPOSITE ROCKET PROPELLANTS CURED WITH AZIRDINE TYPE AGENTS**  
M.A. Bohn  
Fraunhofer ICT, Pfinztal, D  
G.S. Tussiwand  
HAPTICA, Busto Arsizio (VA), I
- 10.00 **V18** **SURFACE MODIFICATION OF AMMONIUM PERCHLORATE WITH NITROCELLULOSE-NANO COPPER OXIDE: THERMAL DECOMPOSITION AND KINETIC MODELING**  
M.K. Boulkadid, M. Nourine, S. Toudjine, H. Akbi, S. Belkhiri  
Ecole Militaire Polytechnique (EMP), Algiers, ALG
- 10.20 **V19** **A NOVEL METHOD FOR IMPROVING THE RELIABILITY OF SIMULATION OF THE BEHAVIOR OF ENERGETIC MATERIALS BASED ON KINETIC ANALYSIS**  
B. Roduit  
AKTS, Sierre, CH  
P. Folly, A. Sarbach  
armasuisse, Thun, CH  
R. Baltensperger  
University of Applied Sciences of Western Switzerland, Fribourg, CH

- 10.40      **Coffee break**
- 11.10      **Poster Session (in the foyer)**
- 12.30      **Lunch break**

**6<sup>th</sup> Session: COMPUTATIONAL METHODS**

Chair: A. Lefrancois

CEA, Gramat, F

Co-Chair: V. Kuchenreuther-Hummel, Fraunhofer ICT

- 14.00    **V20    ROSEBOOM2.4<sup>®</sup> (“RESEARCH OUTPUT SOFTWARE FOR ENERGETIC MATERIALS BASED ON OBSERVATIONAL MODELLING/MACHINE LEARNING”)**  
S. Wahler  
RoseEnergetics UG, München, D
- 14.20    **V21    ENERGETIC MATERIALS AND MACHINE LEARNING: REQUIREMENTS AND APPLICATION**  
M. Heil, J. Langer  
Fraunhofer ICT, Pfinztal, D
- 14.40    **V22    STASIS: A PARALLEL MULTI-PHASE CHEMICAL EQUILIBRIUM CODE**  
A.J. Parker  
Fluid Gravity Engineering Ltd., St. Andrews, UK
- 15.00      **Coffee break**

**7<sup>th</sup> Session: MODELLING**

Chair: M.L. Hobbs

Sandia National Laboratories, Albuquerque, USA

Co-Chair: A. Omlor, Fraunhofer ICT

- 15.30 **V23 APPLICATION OF CHEMOMETRICS TO SPECTROSCOPIC DATA FOR RAPID ANALYSIS OF ENERGETICS AND RAW MATERIALS**  
F. Sullivan, P. Abbate  
US Army, Picatinny Arsenal, USA  
N. Ioannidis, S. Patel, C. Gogos, M. Jaffe, S. Tirmizi, J. Wu, X. Li  
New Jersey Institute of Technology, Newark, USA  
R. Bray, E. Leone  
Exel Laboratory Services, Dover, USA
- 15.50 **V24 SUBSTITUENT EFFECT ON ACTIVE INGREDIENTS CONTAINING NITROGEN HETEROCYCLES: A COMPUTATIONAL STUDY**  
L. Amorim da Silva, G. Monteiro de Castro, I. Borges Junior, A. Cardoso Anastacio  
Military Institute of Engineering, Rio de Janeiro, BR
- 16.10 **V25 MOLECULAR DYNAMIC SIMULATION AND SENSITIVE EXPERIMENT FOR GRAPHENE OXIDE WITH CL-20**  
Xiaolong Fu  
Xian Jiaotong University, Xian, PRC
- 16.30 **V26 BROKEN-SYMMETRY DENSITY FUNCTIONAL THEORY STUDY ON PYROLYSIS MECHANISMS OF 3-NITRO-1, 2, 4-TRIAZOL-5-ONE (NTO)**  
Ling Ling, Yuxue Li, Long Lu  
Shanghai Institute of Organic Chemistry CAS, Shanghai, PRC

- 16.50 – 17.30 **Coffee / Refreshments**
- 17.30 **Bus Departure from Conference Hall to Fraunhofer ICT**
- 18.00 **Get-together** – Barbeque Party, offering wine, draught beer and (approx. 18.30) some **Guided Tours of Fraunhofer ICT**
- 22.30 **Fireworks**

Bus transfer to hotels, Karlsruhe City and Main Station will be available (starting 19.00 h during the whole evening).

**We would like to thank Zink-Feuerwerk GmbH, 74389 Cleeborn, Germany for sponsoring the fireworks.**

## Friday, June 30

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### **8<sup>th</sup> Session: CHARACTERIZATION**

Chair: D. Spitzer

ISL, Saint-Louis, F

Co-Chair: C. Teicht, Fraunhofer ICT

- 9.00 **V27 ELABORATION, CHARACTERIZATION AND THERMAL DECOMPOSITION KINETICS OF ENERGETIC COMPOSITES BASED ON NANOSTRUCTURED CELLULOSE NITRATE**  
H. Boukeciat, D. Trache, A.F. Tarchoune, A. Abdelaziz  
Ecole Militaire Polytechnique (EMP), Algiers, ALG

Friday, June 30

- 9.20 **V28** **QUANTITATIVE ANALYSIS OF NITROGEN OXIDE GAS GENERATED BY AGING DECOMPOSITION OF NITRATE ESTER PLASTICIZED ETHER PROPELLANTS**  
Yang Gen, Sang Li-Peng, Cao Rong, Chi Xu-Hui, Li Wei  
Hubei Institute of Aerospace Chemotechnology, Xiangyang, PRC  
Xu Peng  
Southeast University, Nanjing, PRC
- 9.40 **V29** **ROD IMPACT WITH IN-SITU PRESSURE MEASUREMENTS**  
A. Lefrancois, P. Hereil  
CEA/DAM, Gramat, F  
E. Bouton  
CEA/DAM Le Ripault, Monts, F
- 10.00 **V30** **DETERMINATION OF NITROGEN CONTENTS OF NITROCELLULOSE USING REFRACTIVE INDEX AND RAMAN SPECTROSCOPY**  
M. Moniruzzaman, K. Prima Yahya  
Cranfield University, Shrivenham, UK  
P.P. Gill  
Roxel, UK  
L.J. Yuan  
Defence Science and Technology, SGP
- 10.20 **V31** **ADVANCED CHARACTERIZATION OF NITRAMINE ENERGETICS UNDER HIGH PRESSURE**  
S. Neal, Z. Fondren, S. Tenney, R. Patel, V. Stepanov  
US Army, Picatinny Arsenal, USA
- 10.40 **Coffee Break**

**9<sup>th</sup> Session: SAFETY**

**Chair:** A.J. Parker

Fluid Gravity Engineering, St. Andrews, UK

**Co-Chair:** Chairman of 2024 Conference,  
Fraunhofer ICT

- 11.10 **V32 PREDICTING THERMAL RUNAWAY CAUSED BY HOT METAL FRAGMENTS**  
M.L. Hobbs, M.J. Kaneshige, W.W. Erikson  
Sandia National Laboratories, Albuquerque, USA
- 11.30 **V33 FRICTION IGNITION PROBABILITY ANALYSIS OF ENERGETIC MATERIALS**  
F. Paquet, M. Paquet  
General Dynamics OTS, Valleyfield, CAN
- 11.50 **V34 PHLEGMATIZATION OF HIGHLY SENSITIVE EXPLOSIVES FOR THE USE IN EXPLOSIVE DETECTION DOG TRAINING**  
I. Wilhelm, M. Wittek, D. Rösling  
Fraunhofer ICT, Pfinztal, D  
M. Haertel  
Federal Police Technology Center, Lübeck, D  
T.M. Klapötke  
Ludwig-Maximilians-Universität, München, D
- 12.10 **V35 THERMAL RUNWAY OF NITRIC ACID-SOAKED KITTY LITTER IN TRANSURANIC WASTE**  
M.L. Hobbs  
Sandia National Laboratories, Albuquerque, USA
- 12.30 **Closing Remarks**
- 12.40 – 13.45 **Lunch**

# Poster Program

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Posters will be presented during the whole Conference. A special **Poster Session will take place on Thursday, June 29, 11.10 – 12.30 h.** During this time authors should be present for discussion at their posters in the foyer of the Conference Hall.

**P36 ENERGETIC COORDINATION POLYMERS BASED ON 5,5'-BIS(TETRAZOLE)-1,1'-DIOLATE AND METAL COMPLEXES**

H.-W. Yoo, K. Kwon

Agency for Defense Development (ADD),  
Yuseong Daejeon, ROK

**P37 DIAMMONIUM 3,4-BIS(DINITROMETHYL)FUROXAN: ENERGETIC SALTS WITH HIGH OXYGEN BALANCE**

Jun Yang

Shanghai Institute of Organic Chemistry CAS, Shanghai, PRC

**P38 INSENSITIVE SYNTHESIS OF TKX-50**

K. Kwon, H.-W. Yoo, S.J. Lee, S. Kim

Agency for Defense Development (ADD),  
Yuseong Daejeon, ROK

**P39 NITROSTARCH AS A PROMISING INSENSITIVE ENERGETIC BIOPOLYMER: SYNTHESIS, CHARACTERIZATION AND THERMAL DECOMPOSITION KINETICS**

A. Abdelaziz, N. Sahnoun, A.F. Tarchoun, H. Boukeciat,  
D. Trache

Ecole Militaire Polytechnique (EMP), Algiers, ALG

**P40 INVESTIGATION OF THE MIGRATION OF NITROGLYCERINE FROM SOLID ROCKET PROPELLANT GRAIN INTO INSULATION MATERIAL BY IR MICROSCOPY**

M. Kaiser, B. Gotzen

WTD 91, Meppen, D



- P41 USAGE OF BONDING AGENT IN UNDERWATER EXPLOSIVE**  
I.E. Metin, T. Atalar, G.A. Yilmaz  
TÜBITAK SAGE, Ankara, TR
- P42 EFFECT OF DIFFERENT AP SOURCES ON THE MAIN CHARACTERISTICS OF THE HTPB BASED SOLID COMPOSITE PROPELLANTS**  
Z. Kabasakal, M. Yapici, T. Atalar, A.F. Zeybek, D. Cetin  
TÜBITAK SAGE, Ankara, TR
- P43 SYNTHESIS OF NEW HIGH ENERGY MOLECULES**  
L. Blanck, T. Alaime, G. Eck, D. Dru  
EURENCO, Vedene, F  
R. Baati  
ICPEES Universite de Strasbourg, F
- P44 DEVELOPMENT OF A TEST CENTER IN BAUSSENQ**  
R. de La Cuetara, I. Dulac  
EURENCO, Vedene, F
- P45 CALCULATION OF THE ENTHALPY OF FORMATION OF ENERGETIC SALTS BY DENSITY FUNCTIONAL THEORY CALCULATIONS**  
A. Omlor, M.A. Bohn, J. Lang  
Fraunhofer ICT, Pfinztal, D
- P46 CHARACTERIZATION OF AMMONIUM DINITRAMIDE ADN**  
H. Skifs  
Eurenco Bofors, Karlskoga, SE
- P47 RoseBoom2.4® (“RESEARCH OUTPUT SOFTWARE FOR ENERGETIC MATERIALS BASED ON OBSERVATIONAL MODELLING/MACHINE LEARNING”)**  
S. Wahler  
RoseEnergetics UG, München, D

- P48 INVESTIGATION OF THE MICRO-STRUCTURE OF  
PRESSED EXPLOSIVE/WAX/GRAPHITE GRANULATES  
BY MEANS OF X-RAY DIFFRACTION**  
M. Herrmann, P. Gerber  
Fraunhofer ICT, Pfinztal, D
- P49 MOLECULAR SIMULATION OF THE STABILITY AND  
THERMAL BEHAVIOR OF THE COCRYSTAL CL-20/HMX  
USING LAMMPS AND THE FORCE FIELD REAXFF**  
C. Possel, M. Herrmann  
Fraunhofer ICT, Pfinztal, D
- P50 MATERIAL STABILITY STUDIES BY MEANS OF  
TEMPERATURE AND PRESSURE RESOLVED X-RAY  
DIFFRACTION**  
C. Seidel, M. Herrmann  
Fraunhofer ICT, Pfinztal, D
- P51 THE REACTION OF SILICON WITH WATER AND  
POSSIBLE APPLICATIONS**  
V. Weiser, S. Kelzenberg, A. Koleczko, A. Raab  
Fraunhofer ICT, Pfinztal, D
- P52 PAIR DISTRIBUTION FUNCTION ANALYSIS OF  
AMMONIUM NITRATE – COMPARISON OF  
PDF- AND RIETVELD-ANALYSIS**  
P.B. Kempa, M. Herrmann  
Fraunhofer ICT, Pfinztal, D
- P53 STATISTICAL SIMULATION DEVELOPMENT USING THE  
EXAMPLE OF THERMITE MIXTURES**  
W. Becker, S. Knapp  
Fraunhofer ICT, Pfinztal, D
- P54 THE ROLE OF OXYGEN AND HUMIDITY IN NC  
DECOMPOSITION**  
M. Heil, M.A. Bohn, C. Müller, J. Hickmann, M. Dörich,  
T. Grunwald, C. Fuchs  
Fraunhofer ICT, Pfinztal, D

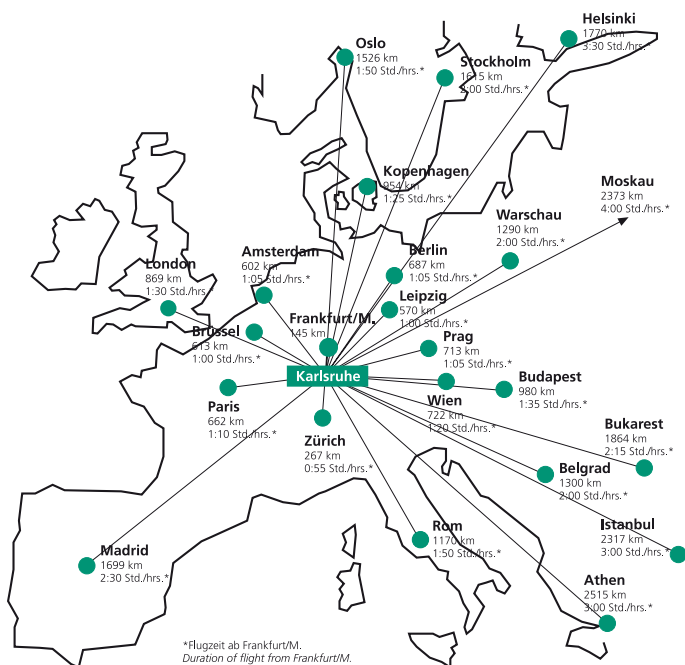
- P55 COMPATIBILITY OF NITROGUANIDINE WITH SEVEN HIGH EXPLOSIVES DETERMINED BY GAS GENERATION AND HEAT FLOW MICROCALORIMETRY**  
M.A. Bohn, M. Heil, H. Pontius  
Fraunhofer ICT, Pfinztal, D  
E.-C. Koch  
Lutradyn Energetic Materials, Kaiserslautern, D
- P56 CHEMICAL STABILITY AND THERMAL ANALYSIS – THE USE OF TERMS WITH ENERGETIC MATERIALS WITH REGARD TO CHEMICAL-THERMAL DECOMPOSITION**  
M.A. Bohn  
Fraunhofer ICT, Pfinztal, D
- P57 SPRAY-DRYING OF ENERGETIC MATERIALS AT THE EXAMPLE OF OCTOGEN**  
K. Busch, M. Herrmann, M. Maier, T. Heintz  
Fraunhofer ICT, Pfinztal, D
- P58 MICROSTRUCTURAL CHANGES OF ENERGETIC PARTICULAR SYSTEMS CAUSED BY MECHANICAL STRESS**  
A. Dresel, M. Herrmann  
Fraunhofer ICT, Pfinztal, D  
S. Wolf  
TH Nürnberg, D  
U. Teipel  
University Ulm, D
- P59 EXERTER – SECURITY OF EXPLOSIVES PAN-EUROPEAN SPECIALISTS NETWORK**  
F. Schnürer, M. Wittek, C. Ulrich  
Fraunhofer ICT, Pfinztal, D  
A. Ehlerding  
FOI, Stockholm, SE  
J. Middleton  
PSNI, Belfast, UK

- P60 EVALUATION OF THE REACTIVITY OF HEXYL ISOCYANATE WITH SELECTED STABILIZERS BY <sup>1</sup>H NMR SPECTROSCOPY**  
L. Hettmanczyk, J.-B. Müller, U. Schaller  
Fraunhofer ICT, Pfinztal, D
- P61 SURFACE REGRESSION MODEL FOR HETEROGENOUS STOLID ROCKET MOTORS**  
M. Moroff, S. Wurster, P. Pietrek  
Fraunhofer ICT, Pfinztal, D
- P62 INFLUENCE OF PROPELLANT GEOMETRY ON EROSION IN VENTED VESSEL TESTS**  
V. Kuchenreuther-Hummel, T. Heidebrecht  
Fraunhofer ICT, Pfinztal, D
- P63 STORAGE AND UTILISATION OF THE COMBUSTION HEAT OF GAS GENERATOR PROPELLANTS WITH THERMOCHEMICAL HEAT STORAGE SYSTEMS**  
S. Sims, C. Teicht  
Fraunhofer ICT, Pfinztal, D
- P64 MONITORING MILLING PARAMETERS BY USING FBRM TECHNIQUE**  
N. Korkmaz Cokol, G. Ceylan  
Roketsan, Ankara, TR
- P65 DIPROPYLENE GLYCOL BIS(2-AZIDOBUTYRATE) – A NEW ENERGETIC AZIDO PLASTICIZER**  
T. Keicher, U. Schaller, M. Maier  
Fraunhofer ICT, Pfinztal, D
- P66 INHERIT – AN EU PROJECT AIMING TO REDUCE THREATS FROM HOMEMADE EXPLOSIVES**  
T. Keicher, U. Schaller, G. Dornick, M. Maier  
Fraunhofer ICT, Pfinztal, D  
H. Önnnerud  
FOI, Tumba, SE

- P67 SYNTHESIS AND APPLICATION OF ENERGETIC MATERIAL ALH<sub>3</sub> COMPLEX**  
Debin Xia, Jian Zhang, Ping Wang, Kaifeng Lin, Yulin Yang  
Harbin Institute of Technology, Harbin, PRC
- P68 PRESSURE DEFLAGRATION LIMIT OF NEPE SOLID PROPELLANTS**  
Hong-Min Shim, Sung June Kim, Byoung Sun Min,  
Chang Kee Kim  
Agency for Defense Development, Yuseong Daejeon, ROK
- P69 EXPERIMENTAL SETUP TO MEASURE THE AMMONIA EVOLVED DURING THE MANUFACTURE OF COMPOSITE SOLID PROPELLANTS CONTAINING POLYAMINE BONDING AGENT**  
M. Ferrapontoff Lemos, F. Santos da Luz,  
P. Simoes Teixeira Amaral  
Brazilian Navy Research Institute, Rio de Janeiro, BR  
R.V. Costa Limoeiro  
Company for Naval Projects / Federal University of  
Rio de Janeiro, BR  
M. Goncalves Mothe  
Federal University of Rio de Janeiro, BR
- P70 EXPLORING THE USE OF A THERMOMECHANICAL ANALYZER TO ASSESS THE AGING OF PROPELLANTS**  
M. Ferrapontoff Lemos, F. Santos da Luz, A.P. da Silva,  
J. Peixoto Barroco Magalhes  
Brazilian Navy Research Institute, Rio de Janeiro, BR  
R.V. Costa Limoeiro  
Company for Naval Projects / Federal University of  
Rio de Janeiro, BR
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