

## Program

47<sup>th</sup> International Annual  
Conference of the Fraunhofer ICT  
**June 28 – July 1, 2016**

Convention Center,  
Karlsruhe, Germany

# Energetic Materials

Synthesis,  
Characterization,  
Processing

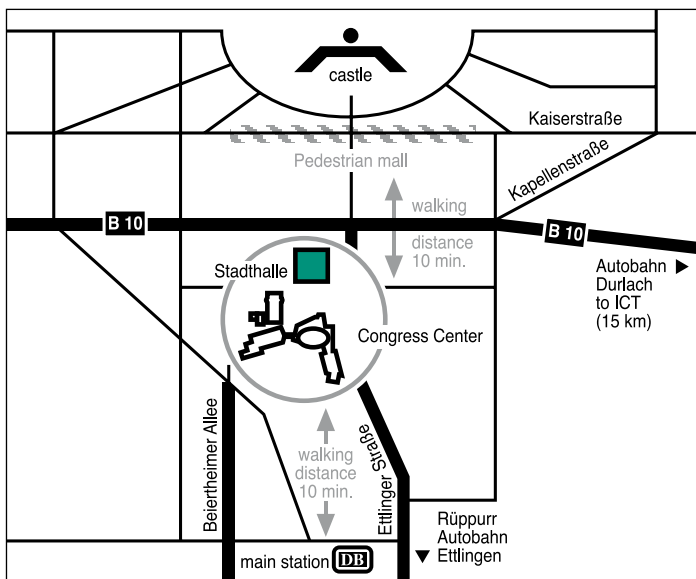


**Fraunhofer**

ICT

# Karlsruhe City Plan

## 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)

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### Congress Center Karlsruhe

Festplatz 9

76137 Karlsruhe

Germany

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# 47<sup>th</sup> International Annual Conference of the Fraunhofer ICT

## **Energetic Materials – Synthesis, Characterization, Processing**

Ongoing research programs worldwide cover the synthesis of energetic compounds and the processing of energetic materials. The classic focus of this research is new energetic materials with enhanced performance and reduced sensitivity. Recently new perspectives have emerged in this field. Increasing awareness of the risks that toxic compounds pose to humans and the environment has led to the banning of hazardous materials, and stimulated the search for non-critical substitute components. Other new perspectives include new synthesis and production methods that are environmentally friendly, or that give access to new energetic materials such as nanocomposites, nano-sized ingredients, co-crystals and energetic ionic liquids.

The 47<sup>th</sup> International Annual Conference of the Fraunhofer ICT will welcome contributions relating to the synthesis of new energetic components, non-hazardous synthesis and processing techniques, particle technology, binders, curing and bonding agents, oxidizers, formulations and characterization. In addition, associated applications in rocket and gun propellants, high explosives and pyrotechnics will be highlighted.

Through participation in the ICT's 47<sup>th</sup> International Annual Conference, scientists from all over the world will have the opportunity to present, discuss and stay informed about the latest developments, and to generate some trend-setting ideas for the future of the energetic materials community.

### **Chairman of the Conference**

Dr. Thomas Keicher  
Fraunhofer ICT, Pfinztal, Germany

# General Information

## REGISTRATION

Please return the enclosed registration form or register online:  
[www.ict.fraunhofer.de/jata2016](http://www.ict.fraunhofer.de/jata2016)

Registration fees (incl. proceedings, coffee breaks, lunch), depending on arrival of the registration form at the Fraunhofer ICT:

- Registration up to **June 10**:  
**EURO 990,-** (incl. 19 % VAT)
- Registration up to **June 17**:  
**EURO 1.250,-** (incl. 19 % VAT)

Participation cannot be guaranteed for registrations arriving after June 17, 2016.

The fee must be paid **upon receipt of the invoice** by bank transfer to the account given on the invoice.

## CANCELLATION POLICY

**EURO 400,-** will be charged for cancellations after **June 17, 2016**.  
**No-shows** will be charged with **EURO 800,-**.

## ACCOMMODATION

Online:  
[www.ict.fraunhofer.de/annual2016accommodation](http://www.ict.fraunhofer.de/annual2016accommodation)

## CONFERENCE OFFICE

### Foyer of the Weinbrenner-Saal.

Open from Tuesday, June 28, 16.00 h till Friday, July 1, 14.30 h **during the conference** and may be reached by

Phone +49 (0) 721 / 37 20 – 57 80  
or +49 (0) 721 / 37 20 – 57 81  
Fax +49 (0) 721 / 37 20 – 59 50

## CHECK IN / WELCOME RECEPTION

Please check in at the conference office on **Tuesday, June 28 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 Stadthalle.

## CONFERENCE LANGUAGE

English

## PROCEEDINGS

One copy is included in the registration fee. Additional copies cost **EURO 99,-** (Subscription price during the conference EURO 70,-).

## GET TOGETHER AND VISIT OF THE INSTITUTE

The Fraunhofer ICT can be visited on **Thursday, June 30** 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**.

## Tuesday, June 28

18.00 – 20.00 **Welcome Reception**  
Foyer of the Stadthalle

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## Wednesday, June 29

09.00 **Welcome Address and Opening**

### 1<sup>st</sup> Session – CHARACTERIZATION I

Session Chair: A.S. Cumming  
University of Edinburgh, GB

- 09.20 **V1 THE LOS ALAMOS GAPSTICK TEST**  
L.G. Hill, D.N. Preston, C.E. Johnson  
Los Alamos National Laboratory, Los Alamos, USA  
A.E. Hill  
Plasmatronics Inc., Albuquerque, USA
- 09.40 **V2 SMALL-SCALE TESTS TO OPTIMIZE THE EXPLOSIVE DISPERSAL OF PARTICLES**  
P. Brousseau  
Defense R&D Canada, Quebec, CAN  
F. Zhang, R. Findlay  
Defense R&D Canada, Medicine Hat Alberta, CAN
- 10.00 **V3 SMALL EXPLOSION CHAMBER DESIGN AND OPTIMIZED CONSTRUCTION BASED IN BLAST PARAMETERS**  
J. Pimenta, J. Quaresma, J. Gois, J. Campos  
LEDAP/ADAI, Coimbra, P
- 10.20 **V4 VELOCIMETRY USED TO DETERMINE GROWTH TO DETONATION IN HEXANITROSTILBENE (HNS)**  
J.D. Olles, R.R. Wixom, R. Knepper, A.S. Tappan,  
C.D. Yarrington  
Sandia National Laboratories, Albuquerque, USA
- 10.40 **Coffee Break**

**2<sup>nd</sup> Session – NEW MATERIALS I**

Session Chair: H. Östmark  
FOI, Tumba, SE

- 11.10 **V5** **PARTICLE SIZE EFFECTS ON THE INITIATION CHARACTERISTICS OF DIAMINOAZOXYFURAZAN (DAAF)**  
E. Francois, D. Chavez, K. Ramos, R. Burritt  
Los Alamos National Laboratory, Los Alamos, USA
- 11.30 **V6** **NANO-COCRISTALLINE NITRAMINES**  
R. Patel, V. Stepanov  
US Army RDECOM-ARDEC, Picatinny Arsenal, USA  
H. Qiu  
Leidos Inc., Picatinny Arsenal, USA
- 11.50 **V7** **MESOPOROUS Co<sub>3</sub>O<sub>4</sub> NANOPOLYHEDRALS: MOF-TEMPLATED SYNTHESIS AND CATALYST FOR THERMAL DECOMPOSITION OF AMMONIUM PERCHLORATE**  
Gen Tang, Aimin Pang, Yingke Qiao  
Hubei Institute of Aerospace Chemotechnology, Xiangyang, PRC  
Haitao Li, Dawen Zeng  
Huazhong University of Science and Technology HUST, Wuhan, PRC
- 12.10 **V8** **PREPARATION AND CHARACTERIZATION OF ALUMINUM BASED NANOTHERMITES FOR MICRO-PROPULSION**  
Ji Dai, Chengbo Ru, Jianbing Xu, Yinghua Ye, Ruiqi Shen  
Nanjing University of Science and Technology, Nanjing, PRC
- 12.30 **Lunch Break**

**3<sup>rd</sup> Session – NEW MATERIALS II**

Session Chair: A. L. Kuhl  
Lawrence Livermore National Laboratory, USA

- 14.00 **V9** **EILS – SUITABLE SUBSTANCES FOR FUTURE ENERGETIC APPLICATIONS?**  
U. Schaller, T. Keicher, V. Weiser, H. Krause  
Fraunhofer ICT, Pfingsttal, D  
S. Schlechtriem  
DLR – German Aerospace Center, Hardthausen, D
- 14.20 **V10** **ENERGETIC SALTS BASED ON HIGH-OXYGEN-BALANCE FURAZAN ANION**  
Haifeng Huang, Yameng Shi, Yanfang Liu, Jun Yang  
Shanghai Institute of Organic Chemistry CAS, Shanghai, PRC
- 14.40 **V11** **HIGH-DENSITY-PHOSPHORUS FOR ENHANCED BLAST AND PYROTECHNIC APPLICATIONS**  
E.-C. Koch  
Lutradyn, Kaiserslautern, D / TUKaiserslautern, D  
S. Cudzilo  
Military Technical University, Warschau, PL

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- 15.00 **V12 DATNBI: AN INSENSITIVE REPLACEMENT FOR RDX**  
E.D. Cooke, A.J. Paraskos, P.R. Cook, P.E. Anderson, K.C. Caffin  
US Army ARDEC, Picatinny Arsenal, USA
- 15.20 **V13 HIGH PERFORMANCE INSENSITIVE ENERGETIC MATERIALS:  
AZO-FURAZANS SYNTHESIS AND CHARACTERIZATION**  
Yanyang Qu, Qun Zeng, Qing Ma, Jun Wang, Hongzhen Li,  
Haibo Li, Guangcheng Yang  
Institute of Chemical Materials CAEP, Mianyang, PRC
- 15.40 **Coffee Break**

**4<sup>th</sup> Session – MODELING**

Session Chair: J. Campos  
University of Coimbra, P

- 16.10 **V14 MODELING MIXING NEAR HE-AIR INTERFACES IN  
EXPLOSIONS**  
A.L. Kuhl, D. Grote  
Lawrence Livermore National Laboratory, Livermore, USA  
J.B. Bell, V.E. Beckner  
Lawrence Berkeley National Laboratory, Berkeley, USA
- 16.30 **V15 A COMMON INITIATION CRITERION FOR EBW  
DETONATORS**  
C. Valancius  
Sandia National Laboratories, Albuquerque, USA
- 16.50 **V16 NUMERICAL PREDICTION OF HTPB PROPELLANTS AGEING  
WITH ANSYS FLUENT**  
B. Dalby  
DGA Essais de Missiles Site Gironde, Saint Medard en Jalles, F
- 17.10 **V17 AUTOMATIC PROPELLANT GRAIN GEOMETRY  
OPTIMIZATION BY GENETIC ALGORITHM**  
A. Hahma  
Diehl BGT Defence, Röthenbach, D
- 17.30 **V18 PROGRESS IN THE REACTIONS OF METASTABLE  
INTERMOLECULAR COMPOSITES AT MICROSCALE FOR  
MICRO-ENERGETIC DEVICES**  
Zhiqiang Qiao, Jun Wang, Bing Huang, Guangcheng Yang  
Institute of Chemical Materials CAEP, Mianyang, PRC

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## Thursday, June 30

### 5<sup>th</sup> Session – FORMULATIONS

Session Chair: R.L. Simpson

Lawrence Livermore National Laboratory, USA

- 09.00 **V19 ZIRCONIUM FUELED RED PYROTECHNIC ILLUMINANTS**  
A. Hahma, O. Pham  
Diehl BGT Defence, Röthenbach, D
- 09.20 **V20 DEVELOPMENT AND QUALIFICATION OF NEW MELT-CAST FORMULATIONS FOR IM APPLICATIONS**  
O.H. Johansen, R. Gjersoe, A. Berg, T. Granby  
Chemring Nobel AS, Saetre, NO  
G.O. Nevstad  
FFI, Kjeller, NO
- 09.40 **V21 NANOSTRUCTURED HE BASED ON NANO-RDX AND NANO-RDX/AI DETONATION PROPERTIES**  
A. Lefrancois, L. Jacquet, G. Zaniolo, M. Genetier, G. Baudin  
CEA/DAM Gramat, Gramat, F  
A. Wuillaume-Keromnes, A. Beaucamp  
CEA/DAM Le Ripault, Monts, F  
K. Woirin, C. Collet  
Safran Herakles, Vert le Petit, F
- 10.00 **V22 NEW ENERGETIC MATERIALS – EXPLOSIVE COMPOSITION BASED FOX-7: PART 2**  
C. Coulouarn, P. Lamy-Bracq, D. Barres  
Nexter Munitions, Bourges, F
- 10.20 **V23 GRAIL: A EUROPEAN INITIATIVE TO DEVELOP GREEN SOLID PROPELLANTS FOR LAUNCHERS**  
N. Wingborg  
FOI, Tumba, SE
- 10.40 **Coffee Break**
- 11.10 **Poster Session**
- 12.30 **Lunch Break**

### 6<sup>th</sup> Session – PROCESSING

Session Chair: R. Doherty

NSWC, Indian Head, USA

- 14.00 **V24 USING RESONANT ACOUSTIC™ MIXER FOR MIXING INERT MATERIAL**  
J. Homan, S. Torry, P. Gould, J. Whittaker  
QinetiQ, Farnborough, GB



- 14.20    **V25    NITRAMINE-RICH AMORPHOUS ENERGETICS**  
V. Stepanov, R.B. Patel, R. Mudryy  
US Army RDECOM-ARDEC, Picatinny Arsenal, USA  
H. Qiu  
Leidos Inc., Picatinny Arsenal, USA
- 14.40    **V26    COMBUSTION SYNTHESIS AND CHARACTERIZATION OF  
ENERGETIC BORIDES**  
A. Vorozhtsov, M. Ziatdinov, A. Zhukov  
National Research Tomsk State University, Tomsk, RUS
- 15.00    **V27    FROM SYNTHESIS TO CRYSTALLIZATION – IMPROVEMENT  
OF HIGH EXPLOSIVES CRYSTAL QUALITY**  
G. Eck, C. Songy, M. Fourdinier  
EURENCO, Sorgues, F
- 15.20    **V28    IN SITU SYNTHESIS OF ENERGETIC CORE-SHELL AI-PTFE  
AND ENHANCED REACTIVITY**  
Jun Wang, Zhiqiang Qiao, Peng Wu, Guangcheng Yang  
Institute of Chemical Materials CAEP, Mianyang, PRC
- 15.40    **V29    IN SITU ROBUST POLYMERIC NETWORK PREPARED  
VIA A SOLVENT- AND CATALYST-FREE THERMAL  
CYCLOADDITION OF GAP WITH TERMINAL-ALKYNES AND  
URETHANE REACTION**  
Byoung Sun Min  
Agency for Defense Development, Yuseong Daejeon, KOR  
Heung Bae Jeon  
Kwangwoon University, Seoul, KOR  
Tae Uk Jeong, Sang Youl Kim  
KAIST, Yuseong Daejeon, KOR

16.00    **Coffee / Refreshments**

17.00    **Bus Departure from Conference Hall to Fraunhofer ICT**

17.30    **Get-together Barbecue Party**  
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.**

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## Friday, July 1

### 7<sup>th</sup> Session – ENVIRONMENTAL ASPECTS

Session Chair: P. Goede  
FOI, Tumba, SE

- 09.20 **V30 TRAINING AMMUNITIONS: THE IDENTIFICATION OF THE CONSTITUENTS OF EXPOSURE AND THEIR EFFECTS ON CULTURED A549 LUNG CELLS**  
M. van Hulst, J.P. Langenberg, W. Duvalois, W.P.C. de Klerk  
TNO Defence, Safety and Security, Rijswijk, NL
- 09.40 **V31 PREDICTION OF REGULATION TOXICOLOGICAL TESTS APPLIED TO HIGH ENERGY MOLECULES**  
C. Alliod, J.A. Chemelle, R. Terreux  
Universite Lyon 1 IBCP, Lyon, F  
G. Jacob  
Centre des Recherches ASL, Vert le Petit, F
- 10.00 **V32 SIMULATION OF DETERRENT CONCENTRATION DECREASE AT THE SURFACE AND ITS SPATIAL CONCENTRATION DURING PROPELLANT STORAGE**  
M. Kaiser  
WTD 91, Meppen, D  
B. Roduit, M. Hartmann  
AKTS AG, Siders, CH  
P. Folly, A. Sarbach  
armasuisse, Thun, CH
- 10.20 **V33 ONE-STEP SYNTHESIS OF ADN FROM FOX-12**  
J. Johansson, S. Ek, M. Skarstind  
FOI, Stockholm, SE
- 10.40 **Poster Awards**
- 11.00 **Coffee Break**

### 8<sup>th</sup> Session – CHARACTERIZATION II

Session Chair: W. de Klerk  
TNO, Rijswijk, NL

- 11.30 **V34 HOT SPOTS SENSITIZATION AND OPTICAL DETONATION MEASUREMENTS OF EMULSION EXPLOSIVES**  
J. Quaresma, J. Pimenta, R. Mendes, J. Gois, J. Campos  
LEDAP/ADAI, Coimbra, P  
L. Deimling, T. Keicher  
Fraunhofer ICT, Pfingztal, D

- 11.50    **V35    EVAPORATION CHARACTERISTICS OF METAL PARTICLES IN AP/HTPB COMPOSITE PROPELLANTS – Al, Mg –**  
R. Doi, S. Kai, Y. Hoshino, T. Kuwahara  
Nihon University, Funabashi Chiba, JAP  
K. Yamamoto, S. Igarashi  
IHI Aerospace Co. Ltd., Tomioka Gunma, JAP
- 12.10    **V36    BURNING BEHAVIOR OF AN/ADN PROPELLANTS**  
C. Tagliabue, V. Weiser, A. Imiolek, V. Gettwert  
Fraunhofer ICT, Pfinztal, D
- 12.30    **V37    CHARACTERISATION OF DIFFERENT GUN PROPELLANTS BY LONG-TERM MASS LOSS**  
M. Heil, K. Wimmer, M.A. Bohn  
Fraunhofer ICT, Pfinztal, D
- 12.50    **V38    CHARACTERISATION AND MODELLING OF THE CURING REACTION OF HTPB WITH ISOCYANATES BY REACTION HEAT DETERMINED BY HEAT FLOW MICROCALORIMETRY AND BY VOLUME SHRINKAGE DETERMINED WITH A PRESSURE CURING CELL**  
M.A. Bohn  
Fraunhofer ICT, Pfinztal, D  
T. Seyidoglu  
Roketsan Missiles Inc., Ankara, TR  
G. Mußbach  
Bayern-Chemie GmbH, Aschau am Inn, D
- 13.10    **V39    THE USE OF VIVACITY IN EVALUATING LAYERED GUN PROPELLANTS**  
T.G. Manning, K. Klingaman, V. Panchal, J. Wyckoff,  
E. Rozumov  
US Army RDECOM ARDEC, Picatinny Arsenal, USA
- 13.30    **Closing Remarks**
- 13.40    **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 30, 11.10 – 12.30 h**. During this time authors should be present for discussion at their posters in the foyer of the Conference Hall.

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- P 40 THERMAL DECOMPOSITION AND PERFORMANCE EVALUATION OF MICROCELLULAR COMBUSTIBLE OBJECT**  
Weitao Yang, Yucheng Zhang, Jianxing Yang  
Xian Modern Chemistry Research Institute, Xian, PRC
- P 41 MECHANISMS AND KINETICS OF THERMAL DEGRADATION OF GLYCIDYL AZIDE POLYMER**  
Shih-Fu Lu  
National Chung Shan Institute of Science and Technology, Taoyuan, ROC
- P 42 SYNTHESIS AND CHARACTERIZATION OF HIGH DETONATION PERFORMANCE AND GOOD OXYGEN BALANCE ENERGETIC MATERIALS: N-TRINITROETHYL-SUBSTITUTED AZOXYFUZZAN**  
Qiong Yu, Hongwei Yang, Guangbin Cheng  
Nanjing University of Science and Technology, Nanjing, PRC
- P 43 INVESTIGATION OF COMPOSITE EXPLOSIVES AND LAYERED CHARGES**  
Lotfi Maiz  
Polytechnic Military School, Algiers, ALG / Military University of Technology, Warsaw, PL  
W.A. Trzcinski, J. Paszula, M. Szala  
Military University of Technology, Warsaw, PL
- P 44 THE INTER-FACIAL INTERACTION AND DIFFUSION MECHANISM OF MOLTEN DNAN ON HIGH-ENERGETIC CRYSTALS: A THEORETICAL INVESTIGATION**  
Wen Qian  
Institute of Chemical Materials CAEP, Mianyang, PRC
- P 45 THE PHOTOCHEMISTRY OF DMAPP IN SOLUTION**  
B. Bazanov, Y. Haas  
Hebrew University Institute of Chemistry, Jerusalem, IL
- P 46 A STUDY ON THE PROPERTY CHANGE OF THERMOPLASTIC PROPELLANTS CAUSED BY PSAN CRYSTAL TRANSFORMATION**  
Qiao Yingke, Pang Aimin, Tang Gen, Li Zhiyong, Lu Guolin  
Hubei Institute of Aerospace Chemotechnology, Xiangyang, PRC
- P 47 DOPING EFFECT OF Zr/KClO<sub>4</sub> IN LASER INITIATOR**  
Kuo-Hua Huang  
National Chung Shan Institute of Science and Technology, Lungtan, ROC
- P 48 APPLICATION OF RUBBER PLATE FOR UNDERWATER SHOCK WAVE MITIGATION**  
Ahmed Hawass, Ahmed Elbeih, Hosam Mostafa  
Military Technical College, Cairo, ET  
Wael El-Dakhakhni  
McMaster University, Hamilton, CAN

# Poster Program

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- P 49 THE EFFECT OF HMX CONTENT ON THE  $\beta \rightarrow \delta$  PHASE TRANSITION IN PBX EXPLOSIVE AT HIGH TEMPERATURE**  
Dai Xiaogan, Wen Yushi, Li Yubin, Li Ming  
Institute of Chemical Materials CAEP, Mianyang, PRC  
Huang Fenglei  
Beijing Institute of Technology, Beijing, PRC
- P 50 EXPERIMENTAL STUDY AND NUMERICAL SIMULATION OF THE SIMULATED DROP IMPACT TESTS OF AGING HMX-BASED PBX**  
Wei Cao, Dayuan Gao, Sha Yang, Shanggang Wen,  
Chunying Shen, Xiaogan Dai  
Institute of Chemical Materials CAEP, Mianyang, PRC
- P 51 TUNING REACTIVITY OF NANOALUMINUM WITH FLUOROPOLYMER VIA ELECTROSPRAY DEPOSITION**  
Hongtao Yang, Chuan Huang, Xiangyu Li, Yanchun Li, Yi Cheng  
Nanjing University of Science and Technology, Nanjing, PRC
- P 52 INFLUENCE OF DIFFERENT PLASTICIZERS ON THE EFFICIENCY OF A STABILIZER IN PROPELLANTS**  
S. Braun, F. Ciszek, B. Wanders, K.-T. Han  
ISL, Saint Louis, F
- P 53 PREDICTION OF HEATS OF FORMATION USING THE SEMI-EMPIRICAL METHODS**  
Hai Whang Lee, Jun Li, Byung Ho Park, Young-Min Kwon,  
Chan Kyung Kim  
Inha University, Incheon, KOR
- P 54 LOW SIGNATURE ADVANCED BASE BLEED PROPELLANTS**  
Ehab M. Youssef, Mostafa A. Radwan, Hosam E. Mostafa,  
Moatafa K. Hadhood  
Egyptian Armed Forces, Cairo, ET
- P 55 CHARACTERIZATION OF SEVERAL HTPB BINDER SAMPLES BY NMR, GPC AND OH NUMBER**  
M. Kaiser, B. Ditz  
WTD 91, Meppen, D  
M. Dörich, M.A. Bohn  
Fraunhofer ICT, Pfintztal, D
- P 56 COMBUSTION PROPERTIES OF NEPE PROPELLANTS FILLED WITH NEW SUPPORTED BURNING-RATE CATALYSTS**  
Gu Jian, Pang Ai-min, Zhang Xiao-ping, Song Qin, Wu Jing-han  
Hubei Institute of Aerospace Chemotechnology, Xiangyang, PRC
- P 57 CHARACTERIZATION OF CHEMICAL SPECIES AND DISTRIBUTION IN THE SURFACE / INTERFACES OF NEPE PROPELLANT / HTPB LINER / EDPM INSULATION**  
Zhi-ping Huang, Hai-ying Nie, Qiuqiu Yang, Jian Zhang, Falong Liu,  
Rulin Cai  
Hubei Institute of Aerospace Chemical Technology, Xiangyang, PRC

# Poster Program

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- P 58 A NOVEL AND GREEN METHOD FOR PRODUCING POLYMER BONDED EXPLOSIVES (PBX) BY USING THERMO-RESPONSIVE PNIPAM AS BINDER**  
Feiyan Gong, Peng Wu, Zhijian Yang, Xiaobing Liu  
Institute of Chemical Materials CAEP, Mianyang, PRC
- P 59 THERMAL DECOMPOSITION KINETICS OF THE SECONDARY NITRAMINES WITH AZOLE SUBSTITUENTS**  
L.A. Kruglyakova, R.S. Stepanov  
Siberian State Technological University, Krasnoyarsk, RUS
- P 60 EFFECT OF MANGANESE OXIDE FORMS ON THE CATALYTIC THERMAL DECOMPOSITION OF AMMONIUM PERCHLORATE**  
R.S. Bharat, R. Patel, R.A. Chandru, C. Oommen  
Indian Institute of Science Aerospace Engineering, Bangalore, IND
- P 61 ALUMINIZED SHEET EXPLOSIVE NAMED ESX-A COMPARED WITH OTHER PLASTIC EXPLOSIVES**  
M. Elnogomi, A. Elbeih  
Military Technical College, Cairo, ET  
T. Elshenawy, H. Abdelrahman  
Technical Research Center, Cairo, ET
- P 62 DFT M06-2X INVESTIGATION ON THE REACTION MECHANISMS OF TNT WITH HYDROXYL RADICALS. I. H-ATOM ABSTRACTION**  
Xi He, Qun Zeng, Xiang-Feng Wei, Yang Zhou  
Institute of Chemical Materials CAEP, Mianyang, PRC  
Qing-Xuan Zeng  
Beijing Institute of Technology, Beijing, PRC
- P 63 INSIGHT INTO THE HEAT-INDUCED POLYMORPHIC TRANSFORMATION OF HEXANITROHEXAAZAISOWURTZITANE (HNIW): THE ROLE OF ADDITIVES**  
Jinjiang Xu, Jie Sun, Yu Liu, Haobin Zhang, Xiaofeng Liu  
Institute of Chemical Materials CAEP, Mianyang, PRC
- P 64 EFFECTS OF MIXING MATERIALS TO THE ALUMINUM PARTICLE COMBUSTION IN SOLID COMPOSITE PROPELLANTS –  $Al_2O_3$  AND Mg –**  
Y. Hoshino, S. Kai, R. Doi, T. Kuwahara  
Nihon University, Funabashi Chiba, JAP  
K. Yamamoto, S. Igarashi  
IHI Aerospace Co. Ltd., Tomioka Gunma, JAP
- P 65 COMBUSTION CHARACTERISTICS OF ALUMINUM PARTICLES IN THE SOLID ROCKET MOTORS AND THE GAS GENERATORS**  
S. Kai, Y. Hoshino, R. Doi, T. Kuwahara  
Nihon University, Funabashi Chiba, JAP  
K. Yamamoto, S. Igarashi  
IHI Aerospace Co. Ltd., Tomioka Gunma, JAP

# Poster Program

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- P 66 STABLE COMBUSTION CHARACTERISTICS IN THE SECONDARY COMBUSTOR OF DUCTED ROCKETS**  
N. Tashita, S. Fujii, S. Watanabe, T. Kuwahara  
Nihon University, Funabashi Chiba, JAP
- P 67 STUDY ON EXPLOSIVE PROPERTIES OF A KIND OF HYDROGEN-STORAGE TYPE EMULSION EXPLOSIVE**  
Gengran Liu, Wenlian Peng  
State Key Laboratory of NBC Protection for Civilian, Beijing, PRC  
Honghao Ma  
University of Science and Technology of China, Hefei Anhui, PRC
- P 68 LOW TEMPERATURE PERFORMANCE ANALYSIS OF T – P CURVE OF THE AIRBAG GAS GENERATOR**  
Lu Zhi-meng, Luo Yun-qiang, Yang Zhi-xiong, Wen Chang-yan, Yao Jun  
Hubei Institute of Aerospace Chemotechnology, Xiangyang, PRC
- P 69 VISCOSITY AND BURNING RATE OF REDUCED SMOKE COMPOSITE PROPELLANT: THE EFFECT OF PARTICLE CHARACTERIZATION OF AMMONIUM PERCHLORATE**  
L.S. Turhan Samiloglu, N.Z. Demirkaya  
Roketsan A.S., Elmadag Ankara, TR
- P 70 LASER-INDUCED DECOMPOSITION BEHAVIORS OF HNS**  
Xuezhi Li, Yu Zheng, Wei Zhang, Ruiqi Shen, Yinghua Ye  
Nanjing University of Science and Technology, Nanjing, PRC
- P 71 NANOSIZING OF MULTI-COMPONENTS ENERGETIC MATERIALS BY SPRAY FLASH EVAPORATION**  
A. Le Brize, F. Schnell, D. Spitzer  
ISL, Saint-Louis, F
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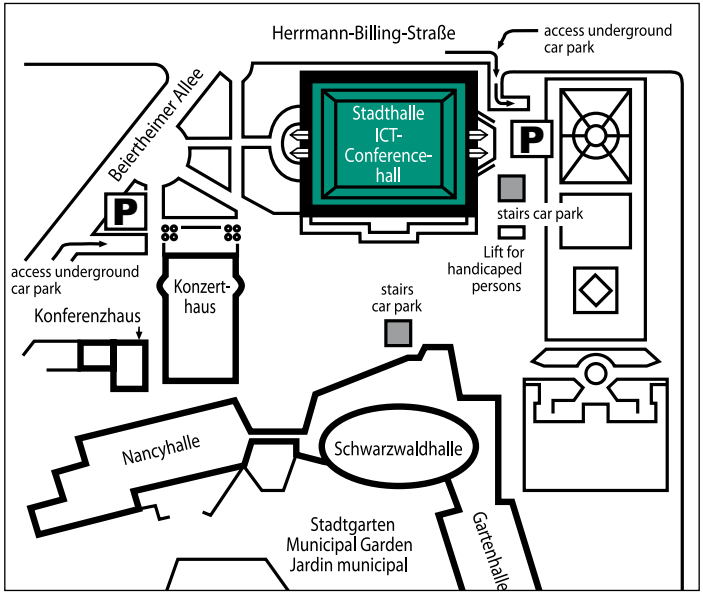
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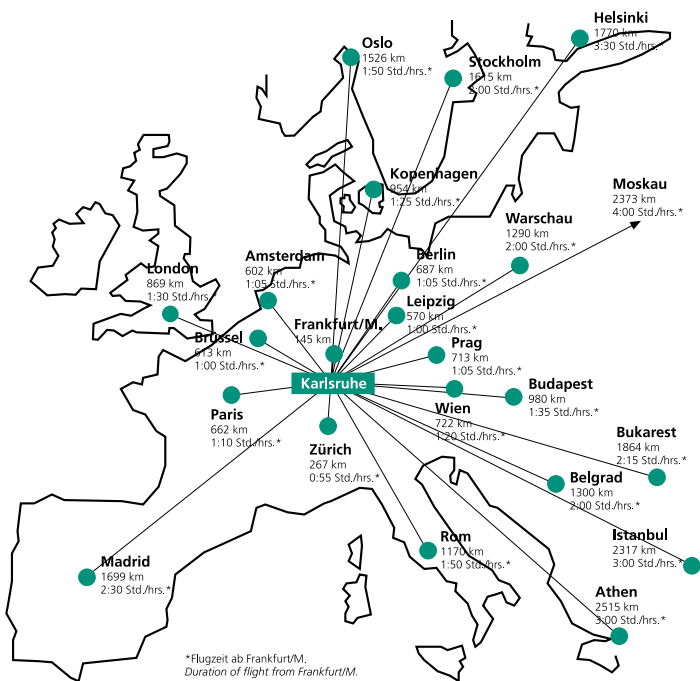
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