



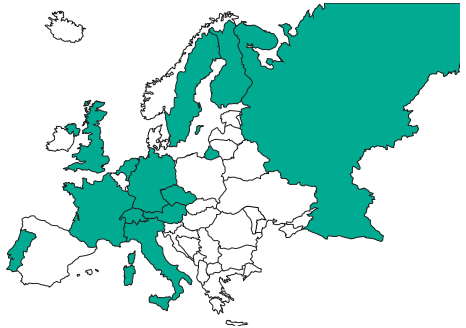
European Working Group
Non-Lethal Weapons

Programme

5th European Symposium on
Non-Lethal Weapons
May 11 - 13, 2009

Stadhalle Ettlingen, Germany

5th European Symposium on Non-Lethal Weapons



Fraunhofer

Institut
Chemische Technologie

Programme Committee

**The European Working Group
on Non-Lethal Weapons (EWG-NLW) serves
as the Programme Committee:**

Helmut Oppenheim
Bundesministerium für Landesverteidigung, Vienna, A

David Humair
armasuisse, Thun, CH

Milan Bezdek
VOP-026 Sternberk, s.p., divize VTUPV, Vyskov, CZ

Jorma Jussila
Keskusrikospoliisi / National Bureau of Investigation, Vantaa, FI

Florence Torrès
DGA, Bagneux, F

Norbert Eisenreich
Fraunhofer ICT, Pfinztal, D

Roberto de Maio
Segredifesa, Rome, I

Igor Plaksin
University of Coimbra, Coimbra, P

Zier Verheij
TNO Defence, Security and Safety, Delft, NL

Victor Selivanov
Baumann University, Moscow, RUS

Ewa Liden
Swedish Defence Research Agency, Tumba, SE

Graham Smith
Home Office Scientific Development Branch, St.Albans, UK

Chairman of the Symposium:

Klaus-Dieter Thiel
Fraunhofer ICT, Pfinztal, D

5th European Symposium on Non-Lethal Weapons

5th European Symposium on Non-Lethal Weapons

Experts in the field of non-lethal weapons are concerned both with investigating and pursuing a detailed approach to new NLW technologies, and with developing a better contextual understanding of this complex subject from a generalised perspective.

2007, the year of the 4th European Symposium on Non-Lethal Weapons was very decisive for NLW. Never since the term NLW was first created had so much motion and activity occurred. Noticeably, NATO installed a Quick Reaction Team, a Topical Group and proposed a new term, "Non-Lethal Capabilities (NLC)". In Europe, the European Defence Agency (EDA) installed a project team specifically in this area and adopted the term "NLC". Now what has changed in principle?

Are there any consequences of the new term, NLC? How will this impact each of the different aspects (legal, medical or operational) involved in NLW?

Chairman of the Symposium
Klaus-Dieter Thiel
Fraunhofer ICT, Germany

Topics

The above questions and more will be discussed at the 2009 Symposium on Non-Lethal Weapons, which will also act as a forum to review current and future non-lethal technologies. This 5th Symposium will be a platform enabling participants to meet with each other and with experts from many different nations. All these aspects together can be seen as a catalyst to strengthen and to enlarge the present NLW-community.

In brief, the Symposium includes topics on:

- Current and advanced technologies
- Operational and tactical aspects (scenario-orientated, case studies...)
- Required capabilities
- Legal and public acceptance
- Effects on target as well as the evaluation of effects

The listed topics should only be considered as guiding principles.

General Information

REGISTRATION

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

- Registration up to **April 20**:
EURO 970,-- (incl. 19% VAT)
- Registration up to **May 4**:
EURO 1.070,-- (incl. 19% VAT)

Participation cannot be guaranteed for registrations arriving after May 4, 2009.

The fee has to be paid **upon receipt of the invoice** either by

- remittance to the account given on the invoice
- or
- cheque

CANCELLATION POLICY

EURO 300,-- will be charged for cancellations after **May 4, 2009**.
No-shows will be charged with **EURO 800,--**.

ACCOMMODATION

HORE Hotel Reservation,
Weingartener Str. 70,
76229 Karlsruhe

Phone +49-(0)7 21/ 48 23 56
Telefax +49-(0)7 21/ 48 26 14
e-mail: HoreHotelReservation@t-online.de

An application form is enclosed.

CONFERENCE OFFICE

Foyer of the Stadthalle Ettlingen.

Monday, May 11, 12.00 h till Wednesday, May 13, 17.30 h during the Symposium to be reached by

Phone +49-(0)72 43/101-158
Fax +49-(0)72 43/101-157

CHECK IN / WELCOME RECEPTION

Please check in at the conference office on

Monday, May 11 between 12.00 and 20.00 h.

All participants are cordially invited to the **Welcome Reception** on the same day, **19.00 h – 21.30 h** in the foyer of the Stadthalle Ettlingen.

CONFERENCE LANGUAGE

English

PROCEEDINGS

One copy is included in the registration fee. Additional copies cost **EURO 70,--** (Subscription price during the conference EURO 50,--).

Programme

DISCUSSION FORUMS

Monday, May 11

DISCUSSION FORUMS

Venue: Stadthalle Ettlingen

13:30 - 16:00

Forum I: NLW HUMAN EFFECTS: OVERVIEW
chaired by Alan Ashworth
Air Force Research Laboratory, Brooks AB, USA

Forum II: SOCIAL IMPLICATION
chaired by Sjef Orbons
Netherlands Defence Academy, Breda, NL

16:30 - 19:00

Forum III: WHAT IS THE TRUTH ABOUT Taser?
chaired by Franz Wolf
WTD 52, Oberjettenberg, D

Forum IV: CRC-MISSIONS OF THE ARMED FORCES AND THE LEGAL CONSEQUENCES OF THE EXTRA-TERRITORIAL APPLICATION ON INTERNATIONAL HUMAN RIGHTS DURING OUT-OF-AREA OPERATIONS
chaired by C. de Cock
International Law Section, Brussels, B

These Forums will be organized as **parallel sessions**, you may decide between Forum I and II and between III and IV. Participation will only be possible for attendees of the Symposium itself. As the number of participants is limited interested persons are asked to register as early as possible (see registration form).

PROGRAMME NLW

Tuesday, May 12

08:00

Opening & Instructions

Opening by the Chairman
K.-D. Thiel
Fraunhofer ICT, Pfinztal, D

Welcome Address

Key Note Lecture

Session 1 PROGRAMME

Chair: Z. Verheij
TNO Defence, Security and Safety, Delft, NL

- 08:50 V 1 STATUS OF RECENT AND ONGOING NATO SYSTEMS ANALYSIS AND STUDIES EFFORTS**
K. Hymes
Joint Non-Lethal Weapons Directorate (JNLWD)
Quantico, USA
- 09:15 V 2 NON LETHAL CAPABILITIES FOR ESDP OPERATIONS**
E. Weissenböck
European Defence Agency, Brussels, B
- 09:40 V 3 STATUS OF UNITED STATES DEPARTMENT OF DEFENSE NON-LETHAL WEAPONS PROGRAM**
K. Hymes
Joint Non-Lethal Weapons Directorate (JNLWD)
Quantico, USA
- 10:05 V 4 FIT FOR PURPOSE: NON-LETHAL WEAPONS**
J. J. M. Paulissen
TNO Defence, Security and Safety, Rijswijk, NL
- 10:30 Coffee Break**

Session 2 OPERATIONAL ASPECTS

Chair: R. De Maio
MoD Segredifesa, Rome, I

- 11:00 V 5 MILITARY REQUIREMENTS FOR THE EMPLOYMENT OF NON-LETHAL WEAPONS**
J. Hoogeveen
BMVg, Bonn, D
- 11:25 V 6 UNITED STATES DEPARTMENT OF DEFENSE (DoD) JOINT NON-LETHAL EFFECTS (JNLE) CAPABILITIES BASED ASSESSMENT (CBA)**
K. Corroon
Joint Non-Lethal Weapons Directorate (JNLWD)
Quantico, USA
- 11:50 V 7 PROTECTION FOR MERCHANT VESSELS AGAINST TERRORISM, PIRACY AND ARMED ROBBERY**
M. Annati,
Teledife-UTT, Milano, I

12:15 **V 8** **NONLETHAL WEAPONS FOR PORT PROTECTION: SCENARIOS AND METHODOLOGY**
R. T. Kessel, C. Strode, R. D. Hollett
NATO Undersea Research Centre (NURC)
La Spezia, I

12:40 **Lunch Break**

Session 3 **LEGAL ASPECTS**
Chair: H. Oppenheim
Bundesministerium für Landesverteidigung,
Vienna, A

13:40 **V 9** **THE JOURNEY OF THE MOSQUITO™: A CASE-STUDY ON THE LEGAL AND PUBLIC ACCEPTABILITY OF SONAR DETERRENCE**
A. Marks
Kings' College, London, UK

14:05 **V 10** **NON-LETHAL WEAPONS AND CHEMICAL WEAPONS CONVENTION**
A. G. Anastassov
Organisation for the Prohibition of Chemical Weapons (OPCW), The Hague, NL

14:30 **V 11** **NON LETHAL WEAPONS AND DISARMAMENT**
F. Krüger-Sprengel
Bonn Office, Bonn, D

14:55 **V 12** **LEGAL REVIEW MECHANISM (ARTICLE 36 GPI) AND THE LAW OF ARMED CONFLICT**
C. De Cock
Ministry of Defence, Brussels, B

15:20 **Coffee Break**

Session 4 **CONDUCTED ENERGY DEVICES**
Chair: S. Reindl
WTD 52, Oberjettenberg, D

15:50 **V 13** **Taser IN THE UK: AN ANALYSIS OF TRENDS AND USE**
G. Smith
Home Office Scientific Development Branch,
St Albans, UK

- 16:15** **V 14** **RESEARCH UPDATE OF TASER® ELECTRONIC CONTROL DEVICES**
J. Ho
Hennepin County Medical Center,
Minneapolis, USA
D. M. Dawes
Lompoc Valley Medical Center,
Lompoc, USA
- 16:40** **V 15** **XREP**
D. Sherman
Wayne State University, Detroit, USA
- 17:05** **V 16** **BIOLOGICAL EFFECTS OF HIGH-VOLTAGE PULSE CURRENT AT MEDICAL-BIOLOGIC TESTS FOR SAFETY OF ELECTROSHOCK DEVICES**
S. Lukyanova, O. Grigoriev, A. Koklin,
T. Andrianova
Federal Medical and Biophysical Center of
Federal Medical-Biological Agency of Russia,
Moscow, RUS
- 17:30** **End of Day One**

08:00

KEYNOTE**THE NEED FOR ADVOCACY: A PROPOSAL**

J. B. Alexander
Las Vegas, USA

Session 5**TECHNOLOGIES**

Chair: G. Smith
HOSDB, St. Albans, UK

08:30

V 17

DEVELOPMENT OF A DISTRIBUTED SOUND AND LIGHT SOURCE (DSL) HAIL AND WARNING DEVICE WITH NON-LETHAL WEAPONS POTENTIAL

T. A. Brungart, A. R. Barnard, T. E. McDevitt,
D. M. Jenkins, B. L. Kline, H. L. Petrie, N. C. Nicholas
Institute for Non-Lethal Defense Technologies (INLDT),
Pennsylvania State University State College, USA

08:55

V 18

DETECTING AND DISORIENTING MOBILE OBJECT TO PROTECT AGAINST DIVERS

V. Falcucci
Whitehead Alenia Sistemi Subacquel S.p.A.,
Livorno, I

09:20

V 19

INVESTIGATION OF VORTEX RING LAUNCHERS IN AIR, AND UNDER WATER

J. R. Nedwell
Subacoustech Ltd, Southampton, UK

09:45

Coffee Break

10:15

V 20

VARIABLE PROPULSION SYSTEMS FOR NON-LETHAL PROJECTILE LAUNCHERS

S. Zettl, J. Neutz, K.-D. Thiel
Fraunhofer ICT, Pfinztal, D

10:40

V 21

GALIX 46: A LESS LETHAL AMMUNITION FOR CLOSE COMBAT VEHICLE DISENGAGING – DEVELOPMENT AND QUALIFICATION

E. Galvani
Lacroix Defence & Security, Mazerès, F

11:05

V 22

NON LETHAL WEAPONS: THREAT OR OPPORTUNITY?

L. Bancallari
MBDA Italia S.p.A, La Spezia, I

11:30

Poster Session

13:00

Lunch Break

Session 6 EFFECTS

Chair: E. Liden
FOI, Tumba, SE

- 14:00 V 23 MEDICAL AND BIOLOGICAL ISSUES OF NLW DEVELOPMENT AND APPLICATION**
D. P. Levin, V. V. Selivanov
Bauman Moscow State Technical University
Moscow, RUS
- 14:25 V 24 THE MEDICAL ROLE IN USING LESS THAN LETHAL WEAPON – AN ISRAELI APPROACH**
I. Ostfeld
Israel Defense Forces, IL
- 14:50 V 25 ASSESSMENT OF THE WOUNDING EFFECTS OF 50MM FIREWORKS TURNED AWAY FROM THEIR ORIGINAL PURPOSE DURING RIOTS**
P.-A. Cassar
Centre Technique de la Sécurité Intérieure
Le Chesnay, F
- 15:15 Coffee Break**
- 15:45 V 26 TEST METHODS TO EVALUATE TERMINAL EFFECTS OF KINETIC ENERGY NON-LETHAL WEAPON SYSTEMS**
D. Bourget
Defence R&D Canada – Valcartier, Quebec, CAN
- 16:10 V 27 STUDIES ON THRESHOLDS FOR BLUNT TRAUMA: RELEVANCE FOR NLW**
U. P. Arborelius, D. Rocksén, J. Bursell, D. Gryth, A. Sondén, M. Risling
Karolinska Institute, Stockholm, SE
L.-G. Olsson, J. Davidsson
Chalmers Technical University, Göteborg, SE
- 16:35 V 28 SAFETY OF CIVILIANS IN POLICE AND PEACE-MAKING OPERATIONS WITH THE NON-LETHAL WEAPONS**
V. V. Savostyanov
Sechenov Moscow Medical Academy,
Moscow, RUS
V. Selivanov
Bauman Moscow State Technical University,
Moscow, RUS
- 17:00 Closing Remarks**
K.-D. Thiel

Poster Programme

Posters will be presented during the whole Symposium. A special **Poster Session** will take place on **Wednesday, May 13, 11.30 – 13.00 h**. During this time authors should be present for discussion at their poster boards in the foyer.

OPERATIONAL ASPECTS

- P 29** **DEVELOPING AND EVALUATING IMPULSE CROWD AND RIOT CONTROL SYSTEMS – PEPPER SPRAY BOLT-ON MODULE TO MEET SOME OF THE CHALLENGES IN PEACEKEEPING OPERATIONS**
R. Rahimi
Norwegian Defense Research Establishment (FFI), Kjeller, N
- P 30** **HOSDB STANDARD FOR CS AND PAVA SPRAYS FOR OPERATIONAL POLICE USE, REVISION 1**
S. Croft
Home Office Scientific Development Branch, St Albans, UK
- P 31** **AN ASSESSMENT OF NONLETHAL WEAPONS TECHNOLOGY AND TACTICS FOR MARITIME ASSET PROTECTION**
C. Strode
NATO Undersea Research Centre (NURC), La Spezia, I

LEGAL ASPECTS

- P 32** **NON-LETHAL WEAPONS AND THE PRINCIPLE OF PROPORTIONALITY**
P. Behrens
University of Leicester, Leicester, UK

CONDUCTED ENERGY DEVICES

- P 33** **MULTI-SHOT REMOTE ELECTRIC SHOCK WEAPON**
O. Nemtyshkin, J. Ladjagin
Tolyatti, RUS

TECHNOLOGIES

- P 34** **ELECTRO-MAGNETIC NEUROMUSCULAR MOVEMENT INHIBITOR (ENEMI)**
E. David, A. Fretz , K. Masur, M. Benedix
ZEPU GmbH, Witten, D
M. Raphelt, S. Wachtl
Diehl BGT Defence GmbH & Co. KG, Röthenbach/Pegnitz, D

- P 35 RESULTS FROM ACOUSTIC DIRECTED BEAMS GENERATED BY PHASED ARRAYS**
E. Walschburger, S. Christoffel, S. Knapp, K.-D. Thiel,
N. Eisenreich
Fraunhofer ICT, Pfinztal, D
- P 36 ADAPTIVE KINETIC LESS-THAN-LETHAL WEAPON USING ELECTRO HYDRAULIC EFFECT**
M. V. Silnikov, S .L. Kulakov, K. S. Kulakov, V. I. Lazorkin,
A. I. Mikhaylin
"Special Materials" Ltd., St.-Petersburg, RUS
- P 37 RESEARCH OF PULSED WATERJET DYNAMICAL PROCESS AND ATOMIZATION MECHANISM OF MODERN ANTI-RIOTS WATER CANNON**
Zhan Renjun, Wang Song
Engineering College of CAPF, Xi'an City, PRC
- P 38 POSSIBILITY OF VORTEX RING USE FOR NON-LETHAL EFFECT**
D. P. Levin, V. V. Selivanov
Bauman Moscow State Technical University, Moscow, RUS
- P 39 EFFECT OF DRIVER GAS ON COMPRESSIBLE VORTEX RINGS**
R. Mariani, K. Kontis
University of Manchester, Manchester, UK
- P 40 ANALYSING PROPERTIES OF THE ACTIVE DENIAL SYSTEM (ADS)**
J. Altmann
Technische Universität Dortmund, D
- P 41 MICROWAVE PULSED POWER GENERATOR WITH VIRTUAL CATHOD, NUMERICAL MODEL AND EXPERIMENTS**
P. Fiala
Brno University of Technology, Brno, CZ
- P 42 PYROTECHNIC EXPERTISE FOR LAW ENFORCEMENT AND NON LETHAL PRODUCTS**
M.-C. Frere
Nobelsport SA, Paris, F

EFFECTS

- P 43** **EFFECTS OF HIGH POWER MICROWAVES;
WORK ON 1.6 GHZ AND 9.15 GHZ FIELDS**
M. Risling, E. Malm, M. Angeria
Karolinska Institute, Stockholm, SE
L. Malmgren
University of Lund, Lund, SE
- P 44** **PRINCIPLES AND PROCEDURE OF THE SAFETY TESTS FOR
NLW ON NON-IONIZING RADIATION TECHNOLOGIES**
O. Grigoriev, V. Stepanov, V. Prokofiev
Federal Medical and Biophysical Center of Federal Medical-
Biological Agency of Russia, Moscow, RUS
- P 45** **HUMAN EFFECTS OF LESS LETHAL KINETIC ENERGY
ROUNDS**
C. Bir
Wayne State University, Detroit, USA
- P 46** **TOWARDS OF THE IED'S DESTRUCTORS BASED ON THE
DEMOLITION OF CRYSTALLINE EXPLOSIVES BY HIGH
VELOCITY MULTIPLE NEEDLES**
I. Plaksin, J. Gois, R. Mendes, L. Rodrigues, A. Campos
University of Coimbra, Coimbra, P

PUBLIC ACCEPTANCE

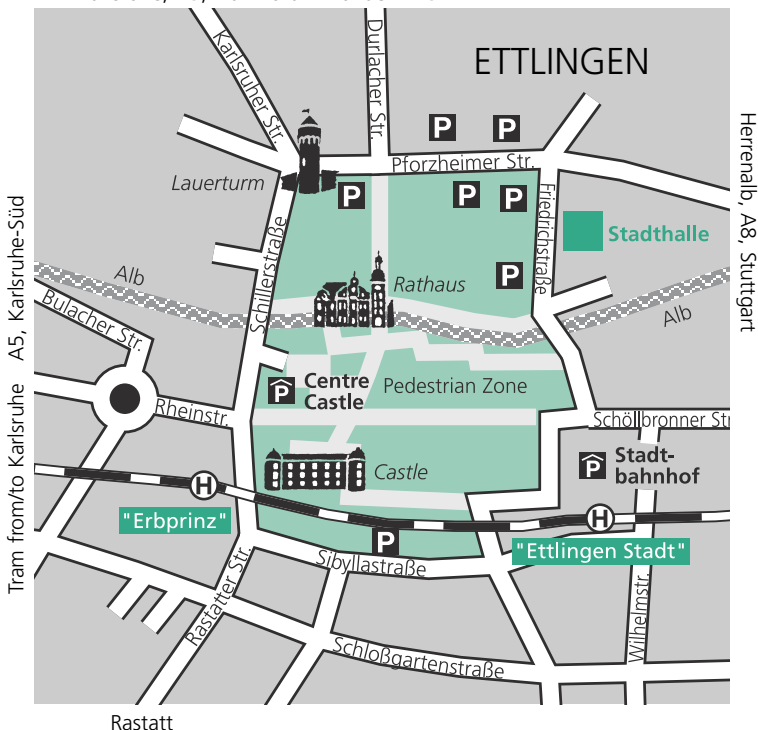
- P 47** **NON V CAPABILITIES AND CONCEPTS NEED SOME FRESH
AIR**
D. Humair
armasuisse, Bern, CH

NOTES

Ettlingen City Plan

How to find the venue

Karlsruhe, A5, Frankfurt Durlach. B 3

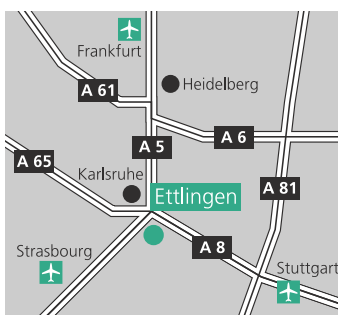


Ettlingen is located in the vicinity of Karlsruhe approx. 120 km south of Frankfurt/Frankfurt International Airport just beside the Autobahn A5.

Other airports are Strasbourg, F (approx. 100 km) and Stuttgart (approx. 90 km)

From the airport you may go by train (approx. 1 hour) to Karlsruhe Hauptbahnhof (Main Station), then take the »Stadtbahn« (tramway)

S1 or S11, direction Ettlingen or Ittersbach, and (after approx. 15 min.) get out at »Ettlingen Stadt« (»Stadtbahnhof Ettlingen«). After a short walk (approx. 10 min.) you reach the »Stadthalle Ettlingen« (see map).



Points of Contact

Chairman

Klaus-Dieter Thiel

Phone: +49 (0)721 4640-375

Fax: +49 (0)721 4640-575

E-Mail: klaus-dieter.thiel@ict.fraunhofer.de

Conference Management / Registration

Manuela Wolff

Phone: +49 (0)721 4640-121

Fax: +49 (0)721 4640-120

E-Mail: manuela.wolff@ict.fraunhofer.de

Exhibition

Roswitha Tuz

Phone: +49 (0)721 4640-403

Fax: +49 (0)721 4640-345

E-Mail: roswitha.tuz@ict.fraunhofer.de

Fraunhofer-Institut für

Chemische Technologie (ICT)

P.O. Box 1240

D-76318 Pfinztal (Berghausen)

Germany

Web site

www.ict.fraunhofer.de

www.non-lethal-weapons.com



**Wehrtechnische Dienststelle für
Schutz- und Sondertechnik (WTD 52)**



Fraunhofer Institut
Chemische Technologie

**HORE
Hotel Reservation
Weingartener Str. 70**

D - 76229 Karlsruhe

Platz für Visitenkarte

Zimmerreservierung / Accommodation

5th European Symposium on Non-Lethal Weapons
Stadthalle Ettlingen, Germany

May 11 - 13, 2009

Name / name _____

Vorname / first name _____

Straße / street _____ Nr. / no. _____

PLZ / zip code _____ Ort / address _____

Land / country _____

Telefax / fax _____

Telefon / phone _____

E-Mail _____

Datum / date _____ Unterschrift / signature _____

Ankunft / arrival Abreise / departure
Ankunftszeit / arrival time

Anzahl der Zimmer / number of rooms EZ (Einzelzimmer) / SGL (single room) DZ (Doppelzimmer) / DBL (double room)

Bitte reservieren Sie Hotel/Please reserve Hotel

		EZ /SGL	DZ /DBL	Entfernung/Distance
A	**** Radisson SAS Standard	135,-- Euro	145,-- Euro	2,0 km
B1	**** Erbprinz Comfort	175,-- Euro	225,-- Euro	0,5 km
B2	**** Erbprinz Classic	155,-- Euro	200,-- Euro	0,5 km
C	*** Stadthotel Engel	98,-- Euro	122,-- Euro	0,5 km
D	*** Watthalden	104,-- Euro	124,-- Euro	0,5 km
E	* Sonne	64,-- Euro	84,-- Euro	0,5 km

Alle Zimmer mit Bad/Dusche/WC, inkl. Frühstück. / All rooms with bath/shower/WC, incl. breakfast.

Kreditkarte / Creditcard Kreditkartennummer zur Garantie / Credit Card No. Gültigkeit / valid until

Falls die gewünschte Hotelkategorie nicht mehr verfügbar ist, reservieren Sie bitte die Kategorie:
If accommodation is not available in the desired category, please reserve category:

Registration Form

5th European Symposium on Non-Lethal Weapons
Stadthalle Ettlingen, Germany

May 11 - 13, 2009

Last name

First name

Title/Position

The registration fee will be paid upon receipt of the invoice.

It is agreed upon that pictures being taken during this event may be published.

Signature

Company / Authority / Complete Address

Participation (please tick)

Welcome Reception *

Monday, May 11, 19.00 h

Discussion Forums *

Monday, May 11, 13.30 - 16.00 h

Forum I or **Forum II**

Monday, May 11, 16.30 - 19.00 h

Forum III or **Forum IV**

*** (incl. in the registration fee)**

e-mail

Phone No.

Fax No.

**Fraunhofer-Institut für
Chemische Technologie • ICT
Attn. Manuela Wolff
P. O. Box 1240**

D - 76318 Pfinztal

