



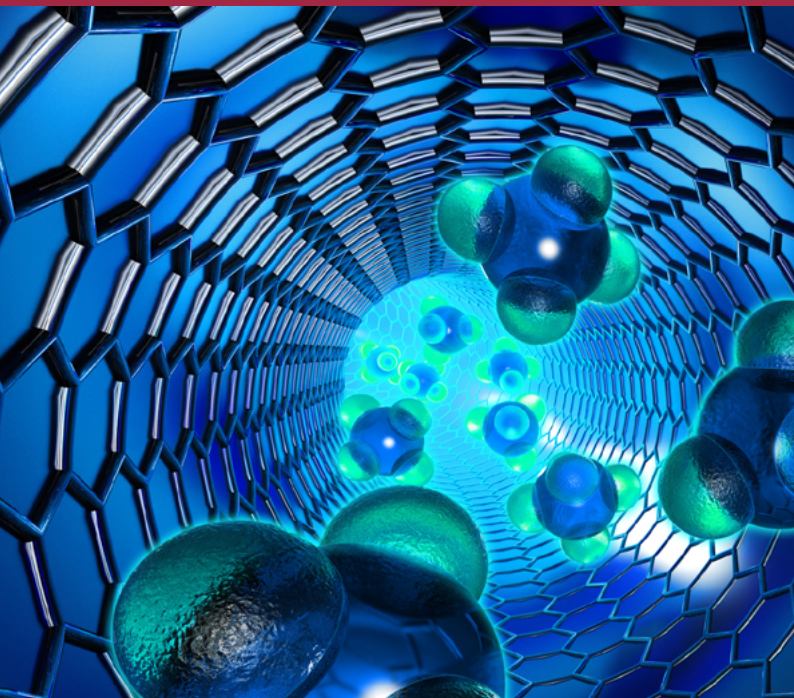
Stuttgarter Produktionsakademie

Fraunhofer IPA | Universität Stuttgart

FUNCTIONAL MATERIALS

THE USE AND RESEARCH OF FUNCTIONAL MATERIALS

FUNCTIONAL MATERIALS – SUMMER SCHOOL
SEPTEMBER, 10TH AND 11TH 2015



INTRODUCTION

You would like to use the calm period during summer for training on the latest developments in materials research? Our Summer School offers just the right place for this.

The two-days seminar with presentations and laboratory tours provides the opportunity to obtain the latest information on the topics synthesis and functionalization, dispersion technology, 3D-printing and application layer technology. We will discuss the use of Nano Carbon materials, Silver Nanowires, Nano-cellulose, 2D-materials, and spherical Metallic Nanoparticles of cooper and silver.

The evening event and an excursion, where you can enjoy some of the cultural highlights of the Stuttgart area and the relaxed atmosphere provides a suitable framework for discussion and dialogue.

We are looking forward to your participation and very interesting discussions.



Prof. Dr.-Ing. Dr. h. c. mult. A. Verl



Prof. Dr.-Ing. T. Bauernhansl

AT A GLANCE

KEY ISSUES

- Use of Carbon Nanotubes, Graphite Nanoplatelets etc. for improving the mechanical and thermal properties of metal matrix materials
- Bottom up and top down approach
- Adapting nanoparticles by functionalisation for applications
- Fraunhofer IPA – 20 years experience with 3D-Printing: History, state of the Art and future trends of Additive Manufacturing
- Coating and Printing technologies for new materials, like 2D materials, graphene flakes
- Transparent electrodes
- Methods and dispersion techniques for stabilization of nanoparticles
- Practical use of functional materials
- Coating methods and production technology of electrodes for high performance energy storage systems

QUALIFICATION OBJECTS

After this seminar, participants have the knowledge how to evaluate the appropriate applications and methods within the fields of functional materials and gain skills to use the new insight in their research.

TARGET AUDIENCE

Researchers and students who are yet working with functional materials or are interested in working with functional materials.

SCHEDULE

DAY 1

08.30 a.m. **Welcome, coffee and hand out of seminar documents**

THEORETICAL SESSION

09.00 a.m. Ivica Kolaric

Welcome and Introduction

09.10 a.m. Ivica Kolaric

Advantages of international collaboration in precompetitive research

10.00 a.m. Dr. Christopher Hubrich

Synthesis & Functionalization of Nanomaterials – methods, approaches

10.45 a.m. Raphael Addinall

Metal Matrix Composites (MMC) as an application example

11.15 a.m. Coffee break

11.30 a.m. Dominik Nemec

Why functional materials (dispersion and compounds)? – Introducing lecture

12.15 p.m. Swetlana Schesler / Dominic Nemec

Dispersion methods

- Overview and proper selection
- Quality of dispersion as a function of the selected parameters (energy input, duration of processing)

01.00 p.m. **Lunch**

02.00 p.m. Steve Rommel

3D-printing: History & current applications

- History of 3D-Printing
- Current State-of-the-Art 3D-printing process
- 3D printing applications

02.45 p.m. Raphael Geiger

Future trends of 3D-printing

- Future outlook on 3D-printing
- What can we expect?
- Combining Technology to achieve ultra-lightweight applications (HyliGht-3D-pRint)

03.30 p.m. **Coffee break**

03.45 p.m. Carsten Glanz

Development of coating processes for new Functionalities

SCHEDULE

04.30 p.m. Thomas Ackermann

Manufacturing Technologies, Properties and cost efficiency of transparent electrodes based on silver nanowires, carbon nanotubes and their combination

05.15 p.m. Sabrina Hellstern

Coating of graphene-based electrodes for energy storage applications

05.50 p.m. **Summary of the first day, Final discussion, Feedback**

06.15 p.m. End of Seminar

07.30 p.m. Get-together Event

DAY 2

08.30 a.m. **Welcome, coffee and hand out of seminar documents**

PRACTICAL SESSION

09.00 a.m. Dr. Christopher Hubrich
Laboratory Instructions

09.15 a.m. Dominik Nemec, Swetlana Schesler
Examples in practice – heating elements – lab work

- Preparation of dispersions and coatings
- Preparation of a planar heating element based on a CNT dispersion
- Characterization (-Optical and electrical measurement methods, -Long-term stability)

12.00 p.m. **Lunch**

01.00 p.m. Steve Rommel, Raphael Geiger
Labour including live-example 3D-Print

02.30 p.m. **Final Discussion & Concluding remarks**

03.00 p.m. **End of Seminar**

SPEAKER

KEYNOTE SPEAKER

Ivica Kolaric

Head of Department Functional Materials

Fraunhofer-Institute for Manufacturing Engineering
and Automation IPA, Stuttgart

Work priorities: Management, Engineering and Business
Administration

SPEAKER

Dr. Christopher Hubrich

Group leader Synthesis & Functionalization

Fraunhofer-Institute for Manufacturing Engineering
and Automation IPA, Stuttgart

Work priorities: Chemistry, Nanotechnology,
Laboratory manager Functionale Materials

Dominic Nemec

Group leader for dispersion technology

Fraunhofer-Institute for Manufacturing Engineering
and Automation IPA, Stuttgart

Work priorities: Nanotechnology, Process technology, Energy
technology, Dispersion, Carbon nanoparticles

Steve Rommel

Group leader Additive Manufacturing

Fraunhofer-Institute for Manufacturing Engineering
and Automation IPA, Stuttgart

Work priorities: Process development Additive Manufacturing
processes, Evaluation and processing new Materials, Additive
hybrid lightweight design, Consulting of technology selection and
integration

Carsten Glanz

Group leader Application technology functional surfaces

Fraunhofer-Institute for Manufacturing Engineering
and Automation IPA, Stuttgart

Work priorities: Application Functional Materials, Printing and
Coating Processes for Nano Materials

Raphael Addinall

Research assistant

Fraunhofer-Institute for Manufacturing Engineering
and Automation IPA, Stuttgart

Work priorities: MMCs, Actuators

Sabrina Hellstern

Research assistant

Fraunhofer-Institute for Manufacturing Engineering
and Automation IPA, Stuttgart

Work priorities: Coating technologies, energy storage, actuators

SPEAKER/CONTACT

Swetlana Schesler

Research assistant

Fraunhofer-Institute for Manufacturing Engineering
and Automation IPA, Stuttgart

Work priorities: Carbon nanotubes, Nanotechnology

Raphael Geiger

Research assistant

Fraunhofer-Institute for Manufacturing Engineering
and Automation IPA, Stuttgart

Work priorities: Additive manufacturing, lightweight design
process, selective laser sintering, plastics

Thomas Ackermann

Research fellow at GSaME

Graduate School of Excellence advanced Manufacturing
Engineering – GsaME, University of Stuttgart

Work priorities: Nanotechnology, Thin Films, Physical Chemistry

CONTACT PERSON

Margarete Zacherl

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ORGANISATIONAL MATTERS

INFORMATION

Stuttgarter Produktionsakademie

c/o Fraunhofer IPA

Mrs. Gabriele Stuber

Nobelstraße 12 | 70569 Stuttgart

Telefon +49 711 970-1208 | Fax +49 711 970-1854

anmeldung@stuttgarter-produktionsakademie.de

REGISTRATION

Registration for participation must be issued in writing and must be addressed to anmeldung@stuttgarter-produktionsakademie.de or via the attached application form or our website.

Please provide the following booking number for your registration: TS_FMSC_150910

as well as the participants names and addresses and if relevant the different billing address. After the registration you will receive an invoice and further information. The closing date for registration is 10 days before the event date.

PARTICIPATION FEE

The participation fee is € 1.230,- (incl. VAT) per person. This fee includes attendance of all lectures, conference documents, lunchtime snack, drinks and snacks.

CHANGE OF REGISTRATION AND CANCELLATION

The registration can be changed and transmitted to another participant free of charge. Please inform us about any change in writing. Please understand that cancellation up to 10 days before the start of the event will be charged with € 100, after this date, the full fee will be due.

ACCOMMODATION

We kindly offer you to book a room at Commundo Tagungshotel, Universitätsstrasse 34, 70569 Stuttgart where a room contingent until July 29th is reserved. After this deadline, please contact the following institution:

Tourist Information i-Punkt | Königstr. 1a | 70173 Stuttgart

Telefon +49 711 22 28-100 | Fax -251

www.stuttgart-tourist.de/en/hotels-stuttgart

VENUE

Fraunhofer-Gesellschaft | Institutszentrum Stuttgart (IZS)

Nobelstraße 12 | 70569 Stuttgart (Vaihingen)

JOURNEY

www.ipa.fraunhofer.de/anfahrt

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Summer school | September, 10th and 11th 2015

FUNCTIONAL MATERIALS

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Last name

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First name

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Title

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Company

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Department

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PO/Street

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Zip code/City

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Phone/Fax

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Email

Registration:

Herewith I sign up definitely for the seminar of the Stuttgarter Produktionsakademie.

FUNCTIONAL MATERIALS

Participation € 1.230,-

Booking number TS_FMSC_150910 on September, 10th and 11th 2015

Please transfer the participation fee on receipt of the registration confirmation and invoice.

Note: In accordance with § 26.1 of the Federal Data Protection Law, we inform you about the storage of your address and the handling with an automated method.

I took note of the conditions which have been announced in the program concerning change of registration or cancellation.

.....
Place/Date

.....
Signature

REGISTRATION

Please return in an envelope or by fax +49 71 1 970-717-1854

Or to anmeldung@stuttgarter-produktionsakademie.de

Tagungsbüro der
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Frau Gabriele Stuber
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70569 Stuttgart



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