7th International Symposium on the Gas-phase Synthesis of Functional Nanomaterials | May 04–06, 2026

Fundamental Understanding, Modeling and Simulation, Scale-up and Application

Venue: NETZ Building, Carl-Benz-Str. 199, 47057 Duisburg
https://www.uni-due.de/cenide/netz/en/contact.php

Keynote presentation: up to 35 min. + at least 10 min. for discussions
Contributed presentation: up to 15 min. + at least 5 min. for discussions

Monday, May 4th	
12:00–13:00	**Arrival and registration**
13:00–13:15	**Welcome** Christof Schulz (University of Duisburg-Essen)
Diagnostics and data analysis 1 (Chair: Sebastian Kaiser)	
13:15–14:00 **Keynote**	**Spectroscopy of reactive molecules: Applications to gas-phase growth species in nanoparticle synthesis** Josh Baraban (Ben-Gurion University of the Negev)
14:00–14:20	**Modeling framework for phase-selective LIBS of nanoparticles** Jan Menser, Christof Schulz (University of Duisburg-Essen)
14:20–14:40	**In situ characterization of the spectral dependence of the optical absorption function of flame-synthesized TiO_2 nanoparticles using a color digital camera and CFD simulations** Ipsita Choudhury, Junghwa Yi, Jérôme Bonnety, Benedetta Franzelli (Paris-Saclay University)
14:40–15:00	**In situ discrimination of liquid and solid iron oxide nanoparticles in plasma synthesis by absorption spectroscopy** Mohamed Elashry[1], Torsten Endres[1], Niklas Jüngst[1], Guannan Liu[2], Christof Schulz[1] ([1]University of Duisburg-Essen, [2]Nanjing University of Science and Technology)
15:00–15:20	**Modeling light scattering from crumpled few-layer graphene: A comparison of crumpling modeling approaches** Halil Ibrahim Yazici[1], Torsten Endres[1], Christof Schulz[1], Kyle Daun[2] ([1]University of Duisburg-Essen, [2]University of Waterloo)

15:20–15:45 ***Coffee break***

Diagnostics and data analysis 2 (Chair: Torsten Endres)	
15:45–16:30 **Keynote**	**Optical diagnostics and applications of flame-synthetized nanoparticles** Silvana De Iuliis (Italian National Research Council)
16:30–16:50	**Laser-optical in situ detection of hetero-aggregate formation during gas-phase synthesis and mixing of TiO_2 and few-layer graphene** Felix Ebertz, Philipp Leistikow, Hartmut Wiggers, Torsten Endres, Christof Schulz (University of Duisburg-Essen)
16:50–17:10	**An intercomparison using the centrifugal particle Mass Analyzer-Electrometer Reference Mass Standard (CERMS) for the calibration of black carbon mass instrumentation instruments for measuring aerosol nanoparticles** Greg Smallwood (National Research Council Canada)
17:10–17:40	**Discussion: Diagnostics and data analysis**
17:40–18:10	**Poster short presentations** All poster presenters
Tuesday, May 5th	
Fundamentals of particle formation, reaction, and growth 1 (Chair: Hartmut Wiggers)	
9:00–9:45 **Keynote**	**Hetero aggregates from the gas phase – building blocks for many applications** Lutz Mädler (University of Bremen)
9:45–10:05	**Plasma–solid reaction of methane and TiO_2 to produce hydrogen and TiC/C nanocomposite via plasma-catalytic pyrolysis** Jafar Fathi[1], Maksym Buryi[1], Michal Hlína[1], Ondřej Jankovský[2], Alan Mašláni[1], Filip Průša[2], Vineet Sikarwar[1] ([1]Czech Academy of Sciences, [2]University of Chemistry and Technology)
10:05–10:25	**Crystal defect characterization and cold plasma treatment of mesoporous CeO_2 nanoparticles synthesized via salt-assisted spray pyrolysis** Benedikt Eberhardt[1], Jalal Poostforooshan[1], Alfred Weber[1], Yiannis Deligiannakis[2] ([1]Clausthal University of Technology, [2]University of Ioannina)

10:25–10:50 ***Coffee break***

10:50–11:10	**Theoretical study of the reaction kinetics of silene species with OH radicals** Qilong Fang[1]; Jun Fang[2], Wei Li[2], Yuyang Li[2] ([1]King Abdullah University of Science and Technology, [2]Shanghai Jiao Tong University)

11:10–11:30	**Reactivity of graphene defect sites with molecular oxygen: Gas-phase kinetics** Fabiola Destro[1], René Fournet[1], Pierre-Alexandre Glaude[1], Amitesh Jayaraman[2], Nikolaos Kateris[3], Andrea Nobili[2], Baptiste Sirjean[1], Hai Wang[2] ([1]Université de Lorraine, [2]Stanford University, [3]University of Cambridge)
11:30-11:50	**Investigating the transition between graphene and soot formation in the gas phase: A shock-tube approach** Ornel Padilla[1], Kyle Daun[2], Christof Schulz[1], Can Shao[1], Hartmut Wiggers[1] ([1]University of Duisburg-Essen, [2]University of Waterloo)

11:50–13:35 ***Conference photo***
Poster session & lunch

Fundamentals of particle formation, reaction, and growth 2 (Chair: Christof Schulz)	
13:35–14:20 **Keynote**	**Watching materials form and transform: Structural insights into phase changes during synthesis** Andrea Kirsch (Ruhr University Bochum)
14:20–14:40	**Nanocubes and cuboctahedra: Entropic stabilization versus thermal segregation in rock salt- and spinel-type multinary oxides from spray-flame synthesis** Hartmut Wiggers[1], Mohammed-Ali Sheikh[1], Steven Angel[1], Sabrina Schleich[1], Leon Müller[1], Jan Ternieden[2], Christof Schulz[1] ([1]University of Duisburg-Essen, [2]Max-Planck-Institut für Kohlenforschung)
14:40–15:00	**Revealing transformation of multi-elements in flame synthesis by phase-selective laser-induced breakdown spectroscopy (PS-LIBS)** Yiyang Zhang, Tianyi Wu, Shuting Lei, Shuiqing Li (Tsinghua University)
15:00–15:20	**Particle–bath-gas interaction and matter exchange during flame synthesis: The prototypical case of iron oxide** Igor Rahinov[1], Matthieu Lalanne[1], Piotr Cwiek[2], Yasin Karakaya[3], Niklas Schmelzer[2], Monika Nanjaiah[2], Sergey Cheskis[4], Tina Kasper[3], Christof Schulz[2], Thomas Dreier[2], IrenäusWlokas[2] ([1]The Open University of Israel, [2]University of Duisburg-Essen, [3]Paderborn University, [4]Tel Aviv University)
15:20–15:50	**Discussion: Fundamentals of particle formation, reaction, and growth**

15:50–16:20 ***Coffee break***

Modeling and simulation 1 (Chair: Irenäus Wlokas)	
16:20–16:40 **Online**	**CarbonX: A process design tool for the gas-phase synthesis of metal nanoparticles and carbon nanotubes** Hossein Rahbar, M. Reza Kholghy (Carleton University)
16:40–17:00	**A thermodynamic resolution of molecular clustering: Eliminating sticking efficiency** Nickolas Eaves (University of Windsor)
17:00–17:20	**Rationalizing quantum-dot behavior in flame-formed carbon nanoparticles: From accurate excitation energies to stacking effects** Luna Pratali Maffei[1], Andrea Nobili[2], Nikolaos Kateris[3], Amitesh S. Jayaraman[2], Matteo Tommasini[1], Hai Wang[2] ([1]Politecnico di Milano, [2]Stanford University, [3]University of Cambridge)
17:20–17:40	**Molecular dynamics simulation of carbon coating on iron-oxide nanoparticles in laminar flame synthesis** Maxwell Robbins[1], Benedetta Franzelli[1], Eirini Goudeli[2] ([1]Paris-Saclay University, [2]The University of Melbourne)

19:00–23:00 ***Dinner*** at Webster Brauhaus, Dellplatz 14, 47051 Duisburg

Wednesday, May 6th	
Modeling and simulation 2 (Chair: Andreas Kempf)	
9:00–9:20	**A multi-modal monodisperse model for hetero-aggregate formation in aerosol streams** Amir Karimi Noughabi, Andreas Kempf, Irenäus Wlokas (University of Duisburg-Essen)
9:20–9:40	**Effects of ammonia, ethanol, and dimethyl ether (DME) blending on soot formation in ethylene combustion** Patrizia Crepaldi, Tiziano Faravelli, Luna Pratali Maffei (Politecnico di Milano)
9:40–10:10	**Discussion: Modeling and simulation**

10:10–10:35 ***Coffee break***

Scale-up and application 1 (Chair: Niklas Jüngst)	
10:35–11:20 **Keynote**	**Plasma synthesis, surface functionalization, and emerging applications of silicon nanocrystals** Uwe Kortshagen (University of Minnesota)
11:20–11:40	**Spray-flame synthesis of doped $LaMnO_3$ nanoparticles for magnetocaloric applications: Toward high-throughput inline and *in situ* diagnostics** Shabbir Tahir, Veysel Ersoy, Christof Schulz, Hartmut Wiggers (University of Duisburg-Essen)
11:40–12:00	**Atomic layer deposition on particulate materials – applications in catalysis and energy** Ruud van Ommen (Delft University of Technology)

12:00–13:30 ***Poster session & lunch***

Scale-up and application 2 (Chair: Christof Schulz)	
13:30–13:50	**Solvent-free spray-flame synthesis based on organometallic compounds** Hans Orthner, Evdoxia Papadimitriou, Hartmut Wiggers, Christof Schulz (University of Duisburg-Essen)
13:50–14:10	**From solar panel to 3D print: Scalable microwave plasma processing of end-of-use PV silicon for laser powder bed fusion** Sophie Marie Schnurre[1], Stefan Kuns[1], Clemens Kunz[2], Frederik Kunze[1], Negin Beryiani Nezafat[3], Gabi Schierning[3], Julia Kristin Hufenbach[2] ([1]Institute of Energy and Environmental Technology [2]Leibniz Institute for Solid State and Materials Research, [3]University of Duisburg-Essen)
14:10–14:30	**Free-standing 2D carbon materials from plasma synthesis for energy applications** Hartmut Wiggers[1], Paolo Fortugno[1], Claudia Francisca López-Cámara[2], Christof Schulz[1] ([1]University of Duisburg-Essen, [2]Eindhoven University of Technology)
14:30–15:10	**Discussion scale-up and application**
	Concluding remarks
15:10	**Optional lab tours**

Posters

1. **Spray-flame synthesis of high-entropy catalysts for oxygen evolution reaction (OER)**
   Yuanxi Li, Shuiqing Li, Yiyang Zhang
   (Tsinghua University)
2. **Simultaneous imaging of PAHs, soot and OH with laser-based methods in an optical spark-ignition engine**
   Esra Bauer, Sebastian Kaiser
   (University of Duisburg-Essen)
3. **Decoding growth conditions: Spatial temperature mapping in carbon-rich plasma flows via NO-LIF**
   Mandy Schaffeld, Christof Schulz, Hartmut Wiggers
   (University of Duisburg-Essen)
4. **Novel kinetic-based sectional model for iron nanoparticles formation and growth**
   Patrizia Crepaldi, Amalia Ricciardi, Tiziano Faravelli, Matteo Pelucchi
   (Politecnico di Milano)
5. **Kinetics insight into hexamethyldisiloxane pyrolysis and combustion**
   Qilong Fang[1,4], Paul Sela[2], Holger Somnitz[2], Jun Fang[1], Jürgen Herzler[2], Long Zhao[3], Yuyang Li[1], Christof Schulz[2], Mustapha Fikri[2]
   ([1]Shanghai Jiao Tong University, [2]University of Duisburg-Essen,
   [3]University of Science and Technology of China,
   [4]King Abdullah University of Science and Technology)
6. **Optimizing the operating conditions of iron oxide nanoparticles synthesized by flame spray pyrolysis using SpraySyn burner**
   Arona Sottas, Adam Bertrand, Marc Briant, Benedetta Franzelli, Yann Leconte, Olivier Sublemontier, Edouard de Rolland Dalon
   (Paris-Saclay University)
7. **Plasma-derived Si-doped graphene as an anchoring matrix for silicon nanoparticles: Enhancing interfacial stability in Li-ion anodes**
   Mohammad Amin Saadati, Hartmut Wiggers
   (University of Duisburg-Essen)
8. **An overview of recent developments of the flame spray pyrolysis platform at Université Paris-Saclay**
   Adam Bertrand, Marc Briant, Guilhem Dezanneau, Benedetta Franzelli, Yann Leconte, Rosario Mendez-Tovar, Remith Pongilat, Arona Sottas, Olivier Sublemontier, Said Yagoubi, Edouard de Rolland Dalon
   (Paris-Saclay University)
9. **A monte carlo model for hetero-aggregate formation in aerosol streams**
   Amir Karimi Noughabi, Andreas Kempf, Irenäus Wlokas
   (University of Duisburg-Essen)
10. **Synthesis of Si-nanoparticles in a radio frequency plasma reactor (RF-Plasma)**
    Alexander Eitner, Hartmut Wiggers
    (University of Duisburg-Essen)

11. **Instantaneous temperature and OH concentration imaging by two-line OH-LIF in spray-flame nanoparticle**
    Torsten Endres, Sadrollah Karaminejad, Thomas Dreier, Christof Schulz
    (University of Duisburg-Essen)

12. **3D tomographic imaging in energy and process technology**
    Khadijeh Mohri, Cheau Tyan Foo
    (University of Duisburg-Essen)

13. **Temperature and phase evolution of individual iron and iron-oxide particles during combustion and hydrogen plasma reduction**
    SayedMehrdad Bathaei[1], Jonas Thiel[2], Marc Böke[2], Torsten Endres[1], Niklas Jüngst[1], Achim von Keudell[2], Christof Schulz[1]
    ([1]University of Duisburg-Essen, [2]Ruhr University Bochum)

14. **Transformation of iron-oxide nanoparticles in flame synthesis: An experimental study in suspension-fed spray flames**
    Shuting Lei[1,2], Sadrollah Karaminejad[2], Yiyang Zhang[2], Tianyi Wu[1], Hartmut Wiggers[2], Shuiqing Li[1], Christof Schulz[2]
    ([1]Tsinghua University, [2]University of Duisburg-Essen)