

## Curriculum vitae



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<b>Date of birth</b>	18.09.1977
<b>Place of birth</b>	Heidelberg
<b>Family status</b>	married, one child
<b>Birth name</b>	Morfill
<b>Education background</b>	MSc (Diploma) PhD (physicist)
<b>Areas of expertise</b>	biophysics, experimental physics, plasma medicine

## PROFESSIONAL EXPERIENCE

### January 2009 – to date

Project manager of the research group “plasma medicine” at the Max Planck Institute for Extraterrestrial Physics.

Plasma medicine is a rapidly growing, interdisciplinary field of research. Objectives of this research field are to design and develop cold atmospheric plasma devices for applications in hygiene and medicine. This requires synergistic work from physicists, engineers, chemists, (micro)biologists and physicians.

The “plasma medicine network”, set up by the Max Planck Institute for Extraterrestrial Physics, includes cooperation partners from more than 20 institutions in Germany, England, USA and Russia.

My responsibilities cover the management and coordination of the approximately 40 scientists – as well as the supervision and execution of the interdisciplinary research projects (including clinical trials).

My project budget is approximately 1.5 Mio Euro/year.

In November 2010 my daughter Anny was born. Due to a complicated pregnancy I was only able to work intermittently from Mai to November. In 2011 my working hours were then also reduced.

### May - December 2008

Scientific manager for the International Doctorate Program “NanoBioTechnology” at the Center for NanoScience (CeNS) at the Ludwig-Maximilians University Munich.

### 2005 - April 2008

Graduation in physics at the Chair of Experimental Physics at the Ludwig-Maximilians University Munich.

Grade: Magna cum laude

Subject of my graduate thesis: Dissociation properties of biomolecules under an externally applied force.

### 2006 - 2008

Additional business: Revision and proofreading of English scientific manuscripts for the Max Planck Institute for Extraterrestrial Physics.

### 2000 - 2006

Student employment: Consulting service for Cable & Wireless Telecommunication Services GmbH, by order of Bech Services GmbH.

### 1997 - 2000

Student employment at the Max Planck Institute for Extraterrestrial Physics.

## INDUSTRY EXPERIENCE

### May 2011

Foundation of the company terraplasma GmbH. The purpose of this company is to effect transfer of the cold atmospheric plasma technology from research into industrial applications.

## EDUCATION

### 1997 - 2005

Physics studies at the Ludwig-Maximilians-University Munich.

Degree: MSc (Diploma)

Grade: very good

Subject of my diploma thesis at the Chair of Experimental Physics at the Ludwig-Maximilians-University Munich: High resolution single molecule force spectroscopy of double-stranded DNA.

### 1988 - 1997

A levels at the St.-Anna Gymnasium in Munich.

Grade: 2,1 (good)

## **PUBLICATIONS** (see publication list)

- Total number of publications (accepted and published): 45
- Cumulative impact factor: 149
- H-index: 12

## **PATENTS**

- MI 4193 (Patent Application PCT, 2010): Penetrating Plasma, see e.g. WO2011110342A1
- MI 4203 (Patent Application PCT, 2010): Plasma Self Sterilizing Surfaces, see e.g. WO2011144344A2
- MI 4301 (Patent Application PCT, 10/2010): Energy harvesting Cold Atmospheric Plasma Generator
- MI 4333 (Patent Application DE 2/2011): Verfahren/Vorrichtung zur Erhöhung der Hygiene in Behältnissen
- MI 4361 (Patent Application DE 4/2011): Kapillarelemente für Plasmaquellen zur Führung der reaktiven Plasmaspezies
- MI 4398 (Patent Application DE 5/2012): Plasma Design für die Zerstörung von Gerüchen
- MI 4400 (Patent Application DE 5/2012): Plasma Design für bakterizide Effekte
- MI 4472 (Patent Application DE 11/2011): Plasmaquelle für O<sub>3</sub>-reduktives Plasma

## **PARTICIPATION/COORDINATION OF PROPOSALS**

### Approved proposals

- **DLR:** Decontamination of spacecraft components using cold atmospheric plasmas. (Short name: PLASMA-DEKON).
- **DLR (Elongation):** Decontamination of spacecraft components using cold atmospheric plasmas. (Short name: PLASMA-DEKON).
- **MPG (Proposal for continuation of the technology transfer projects 2011 - 2013):** Future of plasma medicine.

### Submitted proposals

- **BMBF (Validierung des Innovationspotenzials wissenschaftlicher Forschung – VIP):** Cold atmospheric plasma – an innovative technology for improving food safety for meat products (applicant: Stiftung Tierärztliche Hochschule Hannover).
- **ERC Synergy Grant 2013:** Plasma Cancer Therapy: Use of Cold Atmospheric Pressure Plasmas for Cancer Treatment (PlasmaCaT).

## **REVIEWING BOARD**

### **Reviewer for**

- the Deutsche Forschungsgemeinschaft (DFG)
- different journals (Journal of Physics D: Applied Physics, International Journal of Cancer, New Journal of Physics, PLoS ONE, Plasma Processes and Polymers, etc.)

## **SCIENTIFIC PRESENTATIONS**

### 2013

- Plasma Center Opening at the Moscow State Technical University: “Cold atmospheric plasmas in medical therapy” (invited).
- LMU Kolloquium: “The „Other Plasma“: Plasma physics on the ISS and Plasma medicine in the clinics” (invited).
- NextMed: NextMed/MMVR20: “Cold Atmospheric Plasmas in Medical Therapy” (invited plenary talk).
- Workshop Plasma to Plasma!, Leiden, the Netherlands: “Biological effects of plasma-cell interactions” (invited).

## 2012

- MLL-Kolloquium (at the Ludwig-Maximilians-University Munich): „Cold Atmospheric Plasmas in Medical Therapy” (invited).
- Innovation Days, Munich, Germany: „Plasmas in Medical Therapy“.
- Symposium on "Plasma Medicine" at Ringberg Castle: "New Developments from our Plasma Medicine Network".
- Symposium on "Complex Plasmas" at Ringberg Castle: "Plasma Medicine and Hygiene".
- 39th IEEE International Conference on Plasma Science: "Effects of cold atmospheric plasma on adenoviruses in solution".
- 39th European Physical Society Conference on Plasma Physics/ 16th International Congress on Plasma Physics: "Low Temperature Plasmas for Medical Applications" (invited plenary talk).
- 4th International Conference on Plasma Medicine 4: "Towards Clinical Trials: Medical Phase I Requirements and Execution" (invited).
- Materials Research Society Spring Meeting: "Cold Atmospheric Surface Micro-Discharge Air Plasma Inactivation of *Candida Albicans* Biofilm".

## 2011

- Symposium on "Plasma Medicine" at Ringberg Castle: "Medical Phase I Study of the Small Handheld SMD Plasma Device".

## 2009

- Seminar at the Max Planck Institute for Extraterrestrial Physics: "Dissociation Properties of Biomolecules under an Externally Applied Force".
- 11. Tagung der Region Südost der Deutschen Dermatologischen Akademie: "Plasmamedizin – Neue Möglichkeiten in der Medizin" (invited).
- Symposium on "Health Care Research at MPE and its Partner Institutes" at Ringberg Castle: "Investigation of Bacterial Resistance Build-up against Plasma Treatment".

## AWARDS

- **Selected for "Highlights Collection 2012" in New Journal of Physics - J. L. Zimmermann, T. Shimizu, H.-U. Schmidt, Y.-F. Li, G. E. Morfill and G. Isbary: Test for Bacterial Resistance Build-up against Plasma Treatment; *New Journal of Physics* 14 073037 (2012)**
- **CeNS Publication Award 2009** - H. Gump, E. M. Puchner, J. L. Zimmermann, U. Gerland, H. E. Gaub, K. Blank: Triggering enzymatic activity with force; *Nano Letters* 9, 3290 (2009).
- **CeNS Publication Award 2008** - J. Morfill, J. Neumann, K. Blank, U. Steinbach, E. M. Puchner, K. E. Gottschalk, H. E. Gaub: Force-based analysis of multidimensional energy landscapes: application of dynamic force spectroscopy and steered molecular dynamics simulations to an antibody fragment-peptide complex; *J. Mol. Biol.* 381, 1253 (2008).

## MEMBERSHIPS (in total 2)

- Deutsche Physikalische Gesellschaft
- International Society of Plasma Medicine

## PUBLIC RELATIONS

### 2009-2012

- Interviews for newspapers (FAZ, Focus, Pforzheimer Zeitung, Netdoktor, The Telegraph, Neue Züricher Zeitung, etc.), broadcasting (WDR5 Leonardo – Wissenschaft und mehr 2010, Deutschlandfunk 2011) and television (ZDF heute journal 2009, 3sat nano 2009, BR Rundschau 2011, SF1 Einstein 2011, Deutsche Welle 2013 etc.).

### 2012

- Non-scientific presentation at the Max Planck Institute for Extraterrestrial Physics: „Introducing a Disruptive New Technology for Medicine, Hygiene and Agriculture“.
- Exhibition contribution at the ISS Symposium Berlin 2012: "From Research in Space to Applications on Earth".

**2011**

- Open house presentation at the Max Planck Institute for Extraterrestrial Physics: "Plasmamedizin - Neue Möglichkeiten in der Hygiene und Medizin".
- Publication of a popular scientific article in the journal trillium report Volume 9 issue 4 2011.

**2010**

- Presentation at the "Girls'-Day" 2010 at the Max Planck Institute for Extraterrestrial Physics.

**2008**

- Exhibition at the „Wissenschaftsmeile 2008“ (850 years Munich) for the Center for NanoScience.

**LANGUAGES**

- German: native language
- English: native language
- French: good

**OTHER**

**Design, development and execution of clinical trials**

Design/development of clinical trials – carried out within the framework of the research at the Max Planck Institute for Extraterrestrial Physics (in cooperation with physicists, engineers, (micro)biologists and physicians):

- Design and development of cold atmospheric plasma devices (according to EN 60601 for medical electrical equipment) for clinical studies in dermatology.
- Coordination and execution of preclinical studies (demonstration of the functionality (microbiological investigations), demonstration of safety (biocompatibility investigations etc.).
- Generation of proposals for the responsible ethics commission and other regulatory authorities for approval of clinical studies.

Execution of clinical studies (in cooperation with dermatologists):

- Low temperature argon plasma for in-vivo-sterilization of chronic wounds.
- Low temperature argon plasma for the treatment of pruritic diseases.
- Low temperature argon plasma for the treatment of shingles.