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# Curriculum Vitae

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## Personal Data

### Prof. Dr. Jan Christoph Plefka

Humboldt University Berlin  
Institute of Physics  
Quantum Field und String Theory  
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Born on January 31st 1968 in Hanau, Germany  
Married to Mieke Plefka, three children  
(Nele \*2000, Michel \*2002 and Anton \*2006)  
German nationality

Dated 11. Februar 2024

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## Education

05|1987                   Abitur, Eleonorenschule Darmstadt, Germany (Total grade 1.0)  
07|1987 – 10|1988      German civil service, Alice-Hospital, Darmstadt

### Studies of Physics

10|1988 – 08|1991      Technical University Darmstadt, Germany  
09|1990                   Vordiplom (undergraduate studies)  
08|1991 – 12|1992      Texas A&M University, USA (graduate studies)  
12|1992                   **Master of Science**, Texas A&M University, USA. (GPA 4.0)  
Thesis: “Yang-Mills Coupling and Cosmological Duality  
of Extended Objects”  
Advisor: Prof. Dr. M.J. Duff

### Doctoral studies

02|1993 – 11|1995      Institute for Theoretical Physics, University of Hannover, Germany  
11|1995                   **Dr. rer. nat.** (summa cum laude)  
Dissertation: “Supersymmetric Generalizations of Matrix Models”  
Advisor: Prof. Dr. O. Lechtenfeld

## Habilitation in “Theoretical Physics”

02|2003 Institute of Physics, Humboldt University Berlin, Germany  
Habilitation thesis: “Aspects of Supermembrane und Matrix Theory”

## Academic Appointments

- 01|1996 – 11|1996 **Feodor-Lynen Postdoctoral Fellow**  
Department of Physics, City College of New York, New York, USA
- 12|1996 – 08|1998 **Postdoctoral Fellow**  
Theory Group NIKHEF, Amsterdam, Netherlands
- 09|1998 – 01|2006 **Junior Staff Member**  
Division “Quantum Gravity and Unified Theories”  
Max-Planck-Institute for Gravitational Physics  
(Albert-Einstein-Institut), Potsdam, Germany
- 02|2006 – 01|2011 **Lichtenberg-Professor (W2)** for “Quantum Field Theory beyond the Standard Model and String Theory”, (associate professor, tenure track)  
Humboldt University Berlin, Institute of Physics
- 02|2011 – pres. **Professor (W3)**, Chair “Quantum Field Theory beyond the Standard Model and String Theory” (full professor) ,  
Humboldt University Berlin, Institute of Physics
- 02|2014 – 08|2014 **Visiting Professor**, ETH Zürich,  
Institute for Theoretical Physics, Switzerland
- 03|2018 – 06|2018 **Scientific Associate**, CERN,  
Theory Group, Geneva, Switzerland
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## Research areas

Quantum field theory and Gravity

Modern theory of scattering amplitudes, quantum field theory methods for high-precision gravitational wave physics, color-kinematical duality, supersymmetric gauge theories, perturbative quantum gravity, AdS/CFT duality, strings in AdS space-times, supermembranes, integrable systems.

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## Publications & Talks

- 2 books, more than 95 peer reviewed articles, 10 conference proceedings, 3 academic theses.

- Bibliometry: More than 6000 citations, h-index 43 [INSPIRE-HEP]
  - More than 90 invited talks since 2005
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## Professional Activities

- since 2021 Senator of the German Research Foundation (DFG) and Scientific Member of the Joint Committee, Chair Theoretical Physics
- since 2021 Chairman, University Committee for Research and scientific Careers, HU Berlin (member since 2017).
- since 2020 Spokesperson of the DFG research training group 2575 “Rethinking Quantum Field Theory”
- since 2006 Spokesperson, research area “Particles, Fields and the Universe”, Institute of Physics, HU Berlin,
- 2024-2027 Scientific Advisory Board, Hanse-Wissenschaftskolleg (Institute for Advanced Study)
- 2018-2021 Vice Dean for Research, Faculty of Mathematics and Natural Sciences, HU Berlin
- 2016-2022 Member, DFG Senate Committee for Collaborative Research Centers (SFB-Senats und Bewilligungsausschuss)
- 2018-2019 Member steering committee, Grand Challenge Initiatives, Berlin University Alliance
- 2014-2018 Chairman, Selection Committee “junior researcher scholarships” HU Berlin
- 2013-2018 Member, Minerva-Weizmann Committee of the Minerva Foundation
- 2020-2023 Member of the University Council, HU Berlin
- 2014-2018 Member of the University Council, HU Berlin
- 2013-2014 Chairman, reform committee for the B.Sc. and M.Sc. physics studies, HU Berlin
- 2009-2013 Spokesperson, DFG Research Training Group 1504 “Mass, spectrum, symmetry”
- 2010-2012 Head physics examination board, HU Berlin
- 2011-2013 Member of the Institute of Physics Council, HU Berlin
- 2006-2008 Member of the Institute of Physics Council, HU Berlin
- 2007-2008 Member, selection committee Studienstiftung des Deutschen Volkes

Chairman and member of numerous hiring (Berufungs) and Habilitation committees, HU Berlin and beyond.

Reviewer for the Deutsche Forschungsgemeinschaft, Alexander-von-Humboldt Stiftung, Studienstiftung des Deutschen Volkes and for science funding organizations and foundations in the Canada, China, Denmark, the Netherlands, South Africa, Sweden, UK, USA and the ERC.

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## Honors and Awards

- 2023 Top 100 Scientists of Berlin, Berlin University Alliance & Tagesspiegel
  - 2023 ERC Advanced Grant (GraWFTy)
  - 2006 Lichtenberg-Professorship of the Volkswagen Foundation
  - 1996 Feodor-Lynen-Fellowship of the Alexander von Humboldt Foundation
  - 1991 USA-Stipend of the Fulbright-Commission
  - 1991 Stipend Studienstiftung des Deutschen Volkes
  - Journal of Physics A Highlight Paper: 2014, 2012, 2009
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## Organized conferences and workshops

- 2023 DESY Theory Workshop
  - 2020 SAGEX Amplitudes PhD School
  - 2019 DESY Theory Workshop
  - 2019 31. Workshop Beyond the Standard Model Bad Honnef
  - 2016 Integrability in Gauge and String Theory, Berlin
  - 2016 KOSMOS Summer School on Integrability
  - 2012 Amplitudes, DESY Hamburg
  - 2010 DESY Theory Workshop, Hamburg
  - 2006–2018 Biannual symposium “Ahrenshoop on the Theory of Elementary Particles”
  - 2006–2010 PhD summer school “Foundations and new method of theoretical Physics”
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## Research Grants

- ERC Advanced Grant GraWFTy: “High-precision gravitational wave physics from a world-line quantum field theory”, 10/2023-09/2028, PI, 2.2 Mio €
- Research Training Group 2575 “Rethinking Quantum Field Theory”, (HU Berlin, MPI for Gravitational Physics, DESY), German Research Foundation, 2020-2024, spokesperson, total 4 Mio €
- ITN-Training Network, SAGEX, ERC, 2018-2021, PI: 1 PhD position
- Individual Grant “Yangian Symmetry in Quantum Gauge Theories”, German Research Foundation, 2017-2019, 250k €
- International Max-Planck Research School for Mathematical and Physical Aspects of Gravitation, Cosmology and Quantum Field Theory, 2017-2020, 2 PhD positions

- Research Training Group 1504 “Mass-Spectrum-Symmetry”, (HU Berlin, DESY, TU Dresden), German Research Foundation, 2009-2018, Spokesperson from 2009-2013, PI from 2013-2018, total 6 Mio €
  - Collaborative Research Center “Space-Time-Matter”, (HU Berlin, FU Berlin, U Potsdam), German Research Foundation, 2006-2016, PI in 6 subprojects: 1.4 Mio €
  - Lichtenberg Professorship, Volkswagen Foundation, 2006-2014, 1.15 Mio €
  - International Max-Planck Research School on Geometrical Analysis, Gravitation and String Theory (MPI for Gravitational Physics, HU Berlin, FU Berlin, U Potsdam), 2006-2011, PI, 1 PhD position.
  - Focus Program 1096 “String Theory”, German Research Foundation, 2004-2006, PI 110k €
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## Extended scientific visits

- 04-05|2022 Kavli Institute for Theoretical Physics, Santa Barbara, USA
  - 03-06|2018 Scientific Associate, CERN, Switzerland
  - 03-05|2017 Kavli Institute for Theoretical Physics, Santa Barbara, USA
  - 03 -08 |2014 Guest Professor, ETH Zürich, Switzerland
  - 12|2013 Simons Center for Geometry and Physics, Stony Brook, USA
  - 09 |2013 Kavli IPMU Tokyo, Japan
  - 03-04|2012 Fellow, Israel Institute of Advanced Studies, Jerusalem, Israel
  - 06|2011 Kavli Institute for Theoretical Physics, Santa Barbara, USA
  - 04|2011 Galileo Galilei Institute for Theoretical Physics, Florence, Italy
  - 11|2009 Niels Bohr Institut, Copenhagen, Denmark
  - 07-08|2009 University of British Columbia, Vancouver, Canada
  - 04|2008 Galileo Galilei Institute for Theoretical Physics, Florence, Italy
  - 12|2007 Isaac Newton Institute, Cambridge, UK
  - 07-08|2007 University of British Columbia, Vancouver, Canada
  - 09|2005 Kavli Institute for Theoretical Physics, Santa Barbara, USA
  - 09|2004 Kavli Institute for Theoretical Physics, Santa Barbara, USA
  - 03|2004 Niels Bohr Institut, Copenhagen, Denmark
  - 12|2003 Universität Uppsala, Sweden
  - 03|2002 University of British Columbia, Vancouver, Canada.
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## Teaching experience

### Lectures

Weakly lectures + problem sessions, WS= winter term, SS=summer term

- Classical Mechanics, 4+2 (HU Berlin SS 16, SS 19, SS 21)
- Electrodynamics, 4+2 (HU Berlin WS 16/17, WS 19/20, WS 21/22)
- Quantum Mechanics, 4+2 (HU Berlin SS 09, SS 10, SS 12)
- Advanced Quantum Mechanics, 4+2 (HU Berlin, WS 10/11, WS 12/13, WS 13/14)
- Statistical physics, 4+2 (HU Berlin, WS 11/12, WS 15/16, WS 17/18)
- Advanced Quantum Theory und Statistical Physics, 4+2 (HU Berlin WS 08/09)
- Mathematical foundations, 4+2, (HU Berlin, WS 07/08)
- Quantum field theory I, 3+1, (HU Berlin, WS 06/07, WS 07/08, WS 14/15)
- Quantum field theory II, 2+1, (HU Berlin, SS 07, SS 08, SS 15, SS 20, SS 23)
- Scattering amplitudes in gauge theories, 3+1 (HU Berlin, SS 11, SS 13, WS 20/21, ETH Zürich SS 14)
- Introduction to string theory, 2+1, (HU Berlin, WS 06/07, SS 05 & WS 00/01)
- String theory II, 2+0, (HU Berlin, WS 05/06)
- Supersymmetry, 2+1, (Uni Hannover, SS 02 & HU Berlin, SS 06)

### Lectures at PhD schools

- Classical black hole scattering from quantum field theory, Saalburg Summer School “Foundations and new methods in theoretical physics”, 2023
- Scattering amplitudes in gauge theories and gravity, Cargese Summer School “Rethinking BSM physics”, 2022
- Scattering amplitudes, IMPRS Retreat, Alcudia, 2019
- Scattering amplitudes, Chinese Academy of Sciences, Beijing, 2016
- Yangian symmetry in N=4 super Yang-Mills theory, Zakopane Physics School, 2016
- Symmetries and Dualities of Scattering Amplitudes in N=4 SYM, Parma International School of Theoretical Physics, 2012
- On-shell methods in gauge theory scattering amplitudes, Graduiertenkolleg 1541 “Masse, Spektrum, Symmetrie”, Blockkurs, Rathen, 2011
- Scattering Amplitudes in N=4 super Yang-Mills theory, Copenhagen Elite PhD school “From particles to strings and vice versa”, Niels-Bohr-Institut, 2010
- The plane wave matrix theory, Summer school “Aspects of Membrane Dynamics”, KTH Stockholm, 2007
- Integrability in the AdS/CFT Correspondence, PIMS Summer School on Strings, Gravity and Cosmology, Vancouver, 2006
- Supersymmetry and Supergravity, DFG Stringsteilkurs I, Potsdam, 2005

- $\mathcal{N} = 4$  Super Yang-Mills and Strings on Plane Waves, RTN Winter School, Turin, 2003
  - Stringtheorie, VIII. Heidelberger Graduertentage, 2002
  - M-Theory, DFG Stringsteilkurs II, Halle 2001
  - Aspects of Supersymmetry, Stringsteilkurs I, 2000
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## **Students (in own supervision)**

### **PhD**

- Dr. Canxin Shi (HU Berlin 2022).
- Dr. Julian Miczajka (HU Berlin 2021).
- Dr. Josua Faller (HU Berlin 2019).
- Dr. Wadim Wormsbecher (HU Berlin 2019).
- Dr. Dennis Müller (HU Berlin 2018), Humboldt Prize 2018 of HU Berlin.
- Dr. Hagen Münkler (HU Berlin 2017), Springer Thesis Award 2018.
- Dr. Ilmar Gahramanov (HU Berlin 2016).
- Dr. Martin Heinze (HU Berlin 2014).
- Dr. Theodor Schuster (HU Berlin 2014).
- Dr. Konstantin Wiegandt (HU Berlin 2012), Humboldt Prize 2018 of HU Berlin.
- Dr. Andreas Rodigast (HU Berlin 2012).
- Dr. Per Sundin (HU Berlin 2010).
- Dr. Thomas Klose (HU Berlin 2005).

### **Diplom/Master**

- Rafael Kopp (HU Berlin 2022)
- Tomas Dikacz (HU Berlin 2022)
- Benjamin Sauer (HU Berlin 2022)
- Franziska Porkert (HU Berlin 2020)
- Julien Barrat (HU Berlin 2020)
- Julian Miczajka (HU Berlin 2017), PGzB-Siemens-Prize 2018.
- Anne Spiering (HU Berlin 2017), Lise-Meitner Prize 2018.
- Dennis Müller (HU Berlin 2014)
- Hagen Münkler (HU Berlin 2013)
- Valentin Verschinin (HU Berlin 2012), PGzB-Siemens-Prize 2012
- Josua Groeger (HU Berlin 2012)

- André Großardt (HU Berlin 2010)
- Jonas Pollock (HU Berlin 2012)
- Theodor Schuster (HU Berlin 2009), Lise-Meitner Prize 2009,
- Konstantin Wiegandt (HU Berlin 2008), Heraeus Prize 2009
- Ralf Sattler (HU Berlin 2008)
- Andreas Rodigast (HU Berlin 2007), Heraeus Preis 2008
- Alexander Hentschel (HU Berlin 2007)
- Fabian Spill (HU Berlin 2007), Humboldt-Preis 2007 of HU Berlin
- Petra Gutjahr (Uni Bonn 2004)

### Present PhD students

- Marie Ernø-Møller, “Higher Spin WQFT”
- Benjamin Sauer, “High-precision Classical Gravity from WQFT”
- Gustav Uhre Jacobsen, “Gravitational Wave Physics from Worldline Quantum Field Theory”
- Julien Barrat, “Defect CFTs at weak and strong coupling”
- Felipe Diaz-Jamarillo, “Double copy and double field theory”

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### Selection of ten publications

1. *Gravitational Bremsstrahlung and Hidden Supersymmetry of Spinning Bodies*, G. U. Jakobsen, G. Mogull, J. Plefka and J. Steinhoff, Phys. Rev. Lett. 128 (2022) no.1, 011101.
2. *Classical black hole scattering from a worldline quantum field theory*, G. Mogull, J. Plefka and J. Steinhoff, Journal of High Energy Physics 02 (2021), 048.
3. *Constraining subleading soft gluon and graviton theorems*, J. Broedel, M. de Leeuw, J. Plefka and M. Rosso, Phys.Rev. D90 (2014) no.6, 065024
4. *Harmonic R-matrices for Scattering Amplitudes and Spectral Regularization*, L. Ferro, T. Łukowski, C. Meneghelli, J. Plefka and M. Staudacher, Phys. Rev. Lett. 110, 121602 (2013).
5. *All tree-level amplitudes in massless QCD*, L. J. Dixon, J. M. Henn, J. Plefka and T. Schuster, Journal of High Energy Physics 1101 (2011) 035.



6. *Yangian symmetry of scattering amplitudes in  $N = 4$  super Yang-Mills theory*,  
J. M. Drummond, J. M. Henn and J. Plefka, Journal of High Energy Physics 0905 (2009) 046.
7. *Wilson loops in 3-dimensional  $N=6$  supersymmetric Chern-Simons Theory and their string theory duals*,  
N. Drukker, J. Plefka and D. Young, Journal of High Energy Physics 0811 (2008) 019.
8. *The Off-shell Symmetry Algebra of the Light-cone  $AdS_5 \times S^5$  Superstring*,  
G. Arutyunov, S. Frolov, J. Plefka und M. Zamaklar, Journal of Physics A40 (2007) 3583-3606.
9. *A New Double-Scaling Limit of  $N = 4$  Super Yang-Mills Theory and PP-wave Strings*,  
C. Kristjansen, J. Plefka, G. Semenoff und M. Staudacher, Nuclear Physics B643 (2002) 3-30.
10. *Superspace Geometry for Supermembrane Backgrounds*,  
B. de Wit, K. Peeters und J. Plefka, Nuclear Physics B532 (1998) 99-123.