CURRICULUM VITAE

Herbert K. Dreiner

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BIRTH DATE: Nov. 4, 1962 **PLACE OF BIRTH:** Pittsfield, MA; USA

CITIZENSHIP: USA, GERMANY **FAMILY:** Married,
one daughter (*30.8.97),
one son (*11.4.2000).

EDUCATION AND EMPLOYMENT:

1968–1972	Primary Education in Williamstown, MA, USA.
1972–1981	Secondary Education in Aachen, Germany.
1981–1983	Vordiplom, plus two semesters, Universität Bonn, Germany.
1984–1989	Ph.D. in Theoretical Particle Physics at the University of Wisconsin–Madison under the supervision of D.V. Nanopoulos.
Dec. 1985	MS Physics.
1989–1990	Postdoctoral Associate, Theory Group, DESY, Hamburg.
1990–1993	Postdoctoral Associate, Theoretical Physics, University of Oxford.
1993–1995	Postdoctoral Associate, Theoretical Physics, ETH-Zürich.
1996–2000	Rutherford Laboratory, Senior Scientific Officer (∼university reader).
2000–	Physics Professor, University of Bonn, Germany

AWARDS:

1982–1986	Fellowship from Studien Stiftung des Deutschen Volkes.
Aug. 1987	Scholarship for the Physics Summer School at Cargese, France.
1988–1989	University of Wisconsin Dean's Fellowship.
1991–1993	Elected member of Wolfson College, Oxford.

RESEARCH GRANTS:

1998–2000	Successful application for Athanasios Dedes to hold a Marie-Curie Fellowship at the Rutherford Laboratory.

1998-2000	RAL/Oxford: PPARC SPG on Neutrino Physics, 1 postdoc position and travel money.
2001–2002	Successful application for Gregory Moreau to hold a Humboldt Postdoctoral Fellowship at the University of Bonn under my guidance.
2004–	EU grant: MRTN-CT-2004-503369; The Quest of Unification. Theory confronts experiment
2006–	EU grant: MRTN-CT-2006-035863; UniverseNet - The origin of our universe: seeking links between fundamental physics and cosmology
2006–2009	BMBF Grant, "Determining SUSY Lagrangian Parameters at the LHC".
2006–2010	SFB-TR33, Principal Investigator for project C4: Unified Dark Matter and Energy: Axions
2007-2008	Successful application for Abdelhak Djouadi to hold a Senior Humboldt Fellowship at the University of Bonn.
2007-2012	Co-author of the successful HGF Alliance "Physics at the Terascale" excellence initiative. (5 Mill. EUR/year) Member of Analysis Project Board. Speaker of VTI (Virtual Theory Institute).

TEACHING

Ph.D. STUDENTS:

1990 – 1992	**Jon Butterworth** (Oxford), joint advisor with Doug Gingrich. Topic: *Searches for Supersymmetry with Broken R-parity at HERA via Resonance Production.* Reader Univ. Coll. London
1992 – 1994	**Peter Morawitz** (Oxford), supervised theory and analysis part of thesis in Oxford. Experimental advisor: Neville Harnew. Topic: *Searches for Supersymmetry with Broken R-parity at HERA via Associated Production.*
1997 – 2000	**Peter Richardson**(Oxford), jointly supervised with Michael Seymour. Topic: *Simulations of R-Parity Violating SUSY Models.* Reader, Durham University
1999 – 2002	**Marc Thormeier** (Oxford/Bonn). Topic: *Confronting Froggatt-Nielsen Models for Fermion Masses with Supersymmetry with broken R-Parity.*
2002 – 2006	**Christoph Luhn** (Bonn). Topic: *Supersymmetry Model Building: Investigating Discrete Gauge Symmetries and their Applications for the Fermion Mass Problem*, Postdoc: Univ. of Florida
2004 – 2007	**Ulrich Langenfeld** (Bonn). Topic: *Cosmological, Astrophysical and Collider Bounds on the Lightest Neutralino Mass*
2004 – 2007	**Markus Bernhardt** (Bonn). Topic: *Supersymmetry Model Building: Investigating Discrete Gauge Symmetries and their Applications for the Fermion Mass Problem*
2004 – 2007	**Jong-Soo Kim** (Bonn). Topic: *Supersymmetric Jarlskog invariants: The Neutrino sector*
2006 –	**Sebastian Grab** (Bonn). Topic: *Supersymmetric Signatures at the LHC*

2006 –	**Bransilav Poletanovic** (Bonn). Topic: *Axion and Axino Relic Density in R-Parity Violating Supersymmetry*
2007 –	**Anja Marold** (Bonn). Topic: *CP-Violating Asymmetries in SUSY Pair Production at the ILC*

DIPLOM STUDENTS:

11/2000 – 11/2001	**Pascal Vaudrevange**, *Derivation of Feynman Rules for Two-component Fermions in Supersymmetry.*
4/2001 – 4/2002	**Christoph Luhn**, *Neutrino Masses in R-parity Violation with Complex Yukawa Couplings.*
4/2001 – 4/2002	**Ulrich Langenfeld**, *Lower Bound on the Lightest Neutralino Mass from Supernova 1987a*
11/2001 – 11/2002	**Margarete Herz**, *Bounds on R-parity Violating Couplings from Meson Decays.*
6/2003 – 7/2004	**Markus Bernhardt**, $H \to WW \to \ell\ell\nu\nu$ *as a Higgs Search Mode at the LHC*
7/2003 – 7/2004	**Jong Soo Kim**, *A Simple model for Neutrino Masses in R-parity Violating Supersymmetry*
1/2005 – 1/2006	**Branislav Poletanovic**, *Axino Dark Matter in R-Parity Violating Supersymmetry*
1/2005 – 1/2006	**Sebastian Grab**, *Next-to-Leading Order QCD Corrections to Resonant Slepton Production at Hadron Colliders*
2/2006 – 3/2007	**Anja Marold**, *CP-Violation in Chargino Production and Decay via tau Leptons*

Former Postdocs with Permanent Academic Jobs:

Benjamin Allanach:	Reader, DAMTP Cambridge
Athanasios Dedes:	Reader, Durham University
Michael Krämer:	Professor, RWTH Aachen
Cyril Hugonie:	CNRS Montpellier
Gregory Moreau:	CNRS Paris

LECTURE COURSES:

Spring 1999	*Supersymmetry for Experimentalists*, 8 part graduate lecture course, Oxford University.
WS 2000/01	*Theoretical Elementary Particle Physics* (Halzen & Martin), Bonn University. 16-week lecture course, 3 *hrs* per week.
SS 2001	*Experimental and Theoretical Aspects of Neutrino Physics*, Bonn University. 14-week lecture course, 2 *hrs* per week.
WS 2001/02	*Theoretical Physics I* [classical mechanics (Goldstein), electro- and magnetostatics (Jackson)], Bonn University. 16-week lecture course, 4 *hrs* per week.
SS 2002	*Electrodynamics* (Jackson), Bonn University. 14-week lecture course, 4 *hrs* per week.
SS 2002	*Supersymmetry for Experimentalists*, Bonn University. Six part graduate lecture course for experimentalists working at LEP, Tevatron, HERA and LHC.

WS 2002/03	*Theoretical Elementary Particle Physics* (Halzen & Martin), Bonn University. 16-week lecture course, 3 *hrs* per week.
WS 2002/03	*Cosmology and Astroparticle Physics*, Bonn University. Seminar, talks held by students.
SS 2003	*Neutrino Physics*, Bonn University; together with Prof. Weinheimer. 14-week lecture course, 3 *hrs* per week, plus 2 *hrs* per week problems class.
WS 2003/04	*Collider Physics* (Barger and Phillips), Bonn University; 16-week lecture course, 3 *hrs* per week, plus 2 *hrs* per week problems class.
SS 2004	*Quantum Field Theory*, Bonn University; 14-week lecture course, 3 *hrs* per week, plus 2 *hrs* per week problems class.
WS 2004/05	*Quantum Field Theory II* (Peskin & Schröder), Bonn University; 16-week lecture course, 4 *hrs* per week, plus 2 *hrs* per week problems class.
SS 2005	*Astroparticle Physics and Cosmology*, Bonn University; 14-week lecture course, 3 *hrs* per week, plus 2 *hrs* per week problems class.
WS 2005/06	*Classical Mechanics and Electrostatics* (Kuypers, Jackson), Bonn University; 16-week lecture course, 4 *hrs* per week, plus 3 *hrs* per week problems class.
SS 2006	*Sabbatical*
WS 2006/07	*Theoretical Particle Physics I* (Halzen & Martin), Bonn University; 16-week lecture course, 3 *hrs* per week, plus 3 *hrs* per week problems class.
SS 2006	*Theoretical Particle Physics II*; (grand unified theories; introduction to supersymmetry) 16-week lecture course, 3 *hrs* per week, plus 3 *hrs* per week problems class.
WS 2007/08	*Theoretical Particle Physics I* (Halzen & Martin), Bonn University; 16-week lecture course, 3 *hrs* per week, plus 3 *hrs* per week problems class.

EARLY TEACHING EXPERIENCE:

1984 – 1986	University of Wisconsin: teaching assistant for first year undergraduate physics students. Problem solving sessions and laboratory classes.
1987 – 1989	Grader of graduate level theoretical physics courses. Field theory and quantum mechanics.
1996 – 1999	Tutor at University College, Oxford. Teaching 3rd year undergraduates.
June, 1996	Invited member of E. Perez's (Paris, H1 experiment) thesis defense committee.
Dec., 1999	Invited member of C. Hugonie's (Paris) thesis defense committee.
April, 2001	Invited member of G. Moreau's (Paris) thesis defense committee.

SUMMER SCHOOLS & BLOCK COURSES:

March 1996	6 part lecture course on *Supersymmetry for Experimentalists*; held at the University of Edinburgh
March 1996	6 part lecture course on *Supersymmetry for Experimentalists*; held at the University of Glasgow.
June 1997	6 part lecture course on *Supersymmetry for Experimentalists*; held at the University of Manchester.
Aug. 1998	2 lectures on supersymmetry held at Swiss Summer School in Zuoz, Engadin.

Sept. 1998,	6 lectures entitled: *An Introduction to Supersymmetry for Theorists*, held at BUSSTEPP (British Universities Summer School on Theoretical Elementary Particle Physics).
Sept. 1999	6 lectures entitled: *An Introduction to Supersymmetry for Theorists*, held at BUSSTEPP-99. Voted best lecturer by students.
March 2002	Six part, blackboard lecture course, *Introduction to Supersymmetry*, at Dutch national graduate symposium held at NIKHEF.
Sept. 2002	Four part, black board lecture course on “Introduction to Supersymmetry” at the German Autumn School: Maria Laach.
Feb. 2003	3 part black board lecture course on “Introduction to Supersymmetry” at Schladming, Austria.
Oct. 2004	4 part black board lecture course on “Introduction to Supersymmetry” for astroparticle physicists at Obertrubach, Germany.
Feb. 2006	Lecture course on “Introduction to Supersymmetry” for hadron- and astroparticle physicists at Tübingen, Germany.

PUBLIC UNDERSTANDING OF SCIENCE:

Fall, 1992	Popular 10 part particle physics class in the Department of Continuing Education, University of Oxford (similar to German Volkshochschule).
Dec. 1999	Lecture on elementary particle physics as part of a full day master class for highschool students at the Rutherford Laboratory.
Dec. 2001	Popular lecture on neutrino physics for 200 alumni of Bonn University.
Jan. 2002	Founding of “Physikshow, Universität Bonn”, a fun and entertaining presentation of physics experiments organised with and performed by Bonn physics students.
June 2002	Lecture to high school students on physics dept. open-day at Bonn University.
July 2002	Popular lecture on neutrino physics at *Dies Academicus*, an open day of public lectures held each semester at Bonn University.
Oct. 2002	5 day intensive course at Bonn University: *Introduction to Quantum Mechanics*, for seven highly gifted, last year high school students from all over Germany. Organised and taught together with four theory graduate students from Bonn.
Nov. 2002	Two 2-hour physics shows for 12-14 year old high school students; organised and performed together with 17 third year physics students. Attracted audience of 650 people per show.
Dec. 2002	Talk on neutrinos to Physik Leistungskurs (12^{th} grade) at Nonnenwerth.
Mar. 2003	Repeat of show on four consecutive days. Two days for schools and two days for general audience. Restricted to 550 people per show.
Oct. 2003	New show with an entirely new set of students. 3 performances in Oct and 3 in March 2004.
June 2004	Public Science presentation at *Wissenschaftsnacht* (Science night of Bonn University).
June 2005	Kinderuni lecture together with Physics Show Students. Topic: “Was ist ein Atom?”
Oct. 2004	New Physics show with again new set of $3^{\rm rd}$ year students. 3 performances in Oct and 3 in March 2005.
Oct. 2005	New Physics show with again new set of $3^{\rm rd}$ year students. 3 performances in Oct and 3 in Feb. 2006.
Nov. 2005	2 public lectures entitled “Albert Einstein, 1905, a Three Course menu” at the Deutsche Museum, Bonn.

Dec. 2005	Joint performance with drama group c.t.201 on “Werner Heisenberg, Leben und Werk”
Mar. 2006	Repeat of the talk on Einstein, 1905 for 500 school children at Bonn University.
Mar. 2006	New Physics show performed at the Deutsche Museum, München with 18 students and one technician, 3 performances, 2 for school children, one evening show with admission charge. All “sold” out.
July 2007	New 30min Physics Show about “Water” at Wissenschaftsnacht, Bonn University. Own lecture hall. Joint performance with TV-Show: “Kopfball” on central stage.
Sept. 2006	New show with an entirely new set of students. 3 performances in Sept. and 4 in March 2007.
June 2007	Full day Physics Table at a “Family Fun in the Parks” event in Bonn. Together with 12 students from Physikshow Team.

CONFERENCES ORGANIZED:

Dec. 1996	Organizer (with R.G. Roberts) of annual British Theory Christmas meeting. The conference has 200, mainly British-based participants and lasts 3 days. It consists of 9 or 10 invited hour-long plenary talks, held by international speakers.
Dec. 1997	Together with R.G. Roberts organizer of annual British Theory Christmas meeting.
June 1998	Main organizer for SUSY-98, held in Oxford. Co-organizer: Graham Ross. The conference had 170 international participants and ran for 6 days. Over 120 talks were given in parallel and plenary sessions.
Dec. 1998	Together with R.G. Roberts organizer of annual British Theory Christmas meeting.
May, 1999	Co-organizer of 3 day meeting on Neutrino Physics together with Subir Sarkar. The meeting was attended by 35 experimentalists from around the world and 15 theorists. It was held in Cosener’s House, Abingdon.
Dec. 1999	Together with R.G. Roberts organizer of annual British Theory Christmas meeting.
Dec. 2000	Together with R.G. Roberts organizer of annual British Theory Christmas meeting.
May. 2004	Together with H.-P. Nilles organizer of Planck-04, annual international conference on supersymmetry model building.
Oct, 2004	Initiated and organised the meeting NRW-Pheno in Bad Honnef, joint regional meeting of high-energy experimentalists and theorists.
Aug, 2005	Together with Manuel Drees and H.-P. Nilles organizer of COSMO-05, annual international conference on cosmology and particle physics.
Feb, 2007	Sole organizer of the LHC-D Beyond the Standard Model workshop in Bonn; national meeting
Dec., 2007	Together with Achim Stahl (Aachen) and Arnulf Quadt (Göttingen), organizer of the “Helmholtz Allianz-Physics at the Terascale” kick-off international meeting at DESY.

WORKSHOPS:

1990 LHC Workshop, member of Supersymmetry Working Group. Parallel session talk at final meeting in Aachen. Published contribution on searches for supersymmetry with R-parity violation.

1991 Second HERA workshop. Member of the Beyond the Standard Model group. First publication on resonant squark production at HERA via R-parity violation together with Jon Butterworth (ZEUS).

1991 EE500 Workshop at Annecy, member of Supersymmetry Working Group. Plenary talk on *Resonant Sneutrino Production.* Results published in proceedings.

1992 Tau-Physics Workshop, Columbus, Ohio. Plenary talk on tests of Bell's inequality at LEP via tau lepton decays together with Michael Dittmar. Results published in proceedings.

1994 One month at Aspen Summer Institute on *Searches for Physics Beyond the Standard Model.* Talk on Neutrino Masses and Gauge Symmetries.

1995 Two months at ITP Santa Barbara, *From the Weak Scale to the Planck Scale* Workshop. Talk on *Anomaly-free Gauged R-Symmetries.*

1996 Third HERA Workshop; Convener of the Beyond the Standard Model group. Plenary talk at final meeting to summarize the group's results. Editor of the group's proceedings write-up. Systematic analysis of R-parity violating decays of resonantly produced squarks. Results published in proceedings.

1997 Oxford LEP2 Workshop; Convener of the Beyond the SM group. Two plenary talks to present group results. Analysis of non-resonant single sparticle production at LEP. Results published in proceedings.

1998 Tevatron Run II Supersymmetry/Higgs Workshop; Convener of the Beyond the MSSM working group. Two plenary talks to present group results. Editor of the final report. Simulation of resonant slepton production. Results published in proceedings.

1999 Les Houches Collider Physics Workshop, Convener of the Supersymmetry group.

2001-03 ECFA/DESY Workshop on the Next Linear Collider. Convenor for supersymmetry group.

2004- Initiator and orgnaizer of the annual NRW-Pheno workshops held twice in Bad Honnef.

2006- Together with M. Krämer (Aachen) theory convenor of the "Beyond the Standard Model" group of the LHC-D workshop, which met for the first time April, 2006. It will continue to meet throughout the running of the LHC. Superseded the NRW-Pheno workshops.

COLLABORATIONS WITH EXPERIMENTALISTS:

1990 Collaboration with Felicitas Pauss (CMS, L3) on *LHC searches for Supersymmetry with Broken R-Parity.* Published in the Aachen LHC-Workshop proceedings.

1991 Collaboration with Jon Butterworth (ZEUS) on *Resonant Squark Production at HERA* within the Second HERA Workshop. Results published in the HERA Workshop proceedings and in Nuclear Physics B.

1992 Collaboration with Michael Dittmar (then OPAL, now L3 and CMS) on *A test of Bell's inequality via correlated tau lepton decays at LEP1*. Results published in Physics Letters B.

1993 Collaboration with Grahame Blair and Peter Morawitz (then both ZEUS) on a *Monte Carlo Generator for Supersymmetry at HERA*. Documentation published as a ZEUS preprint.

1994 Collaboration with Peter Morawitz (then ZEUS, now ALEPH) on *Supersymmetry Searches at HERA*. Results published in Nuclear Physics B.

1996 Collaboration with Peter Morawitz (ALEPH) on a possible supersymmetric explanation of the ALEPH 4-jet events. Results published in Physics Letters B.

1996 Collaboration with Michael Dittmar (CMS, L3) on a new signature for the Standard Model Higgs search: $H \to W^+W^- \to \ell^+\nu_\ell\ell^-\bar{\nu}_\ell$. Results published in Physical Review D and Ringberg Workshop.

1996 Collaboration with Emmanuelle Perez and Yves Sirois (both H1) on a systematic study of resonant squark production at HERA followed by supersymmetric gauge decays. Published in the third HERA Workshop proceedings.

1997 Collaboration with Peter Morawitz (ALEPH) on a supersymmetric explanation of the high-Q^2 excess at HERA. Results published in Nuclear Physics B.

1997 Collaboration with Peter Morawitz and Matt Williams (both ALEPH) on single supersymmetric particle production at LEP. Results published in Physics Letters B.

1999 Collaboration with Max Chertok (CDF) and Greg Landsberg (D0) to produce final report for the Tevatron Run II Higgs/Supersymmetry workshop.

2001 Collaboration with Giacomo Polesello (NOMAD, ATLAS) on obtaining bounds on supersymmetry with broken R-parity from meson decays.

2002 Collaboration with Giacomo Polesello (NOMAD, ATLAS) on obtaining bounds on supersymmetry with broken R-parity from NOMAD data.

2004 Collaboration with Thomas Hebbeker (D0, Aachen) on R-parity Violating Signatures at D0.

2007 Collaboration with Klaus Desch (ATLAS, Bonn) on scalar tau LSP signatures at the LHC.

2007 Collaboration with Peter Wienemann (ATLAS, Bonn) on extracting information on supersymmetry breaking from the measurement of the gaugino masses at the LHC.