



universität**bonn**

Universität zu Köln



Bonn-Cologne Graduate School  
of Physics and Astronomy

# Course Overview

Summer Term 2009



bcgs





# BCGS Course Overview

## Summer Term 2009

The following list of courses provides an overview of lectures and seminars in the Master's programmes in Bonn and Cologne.

All listed courses are suitable for BCGS students.

For convenience, the courses are classified according to the three main research areas covered by the Graduate School. Further, you will find courses of general interest as well as special BCGS courses.

We highly recommend to take part in courses associated with your main field of interest even if you have already started working on your Master, Diploma or Ph.D. thesis. Especially offers from the respective partner university may prove highly valuable.

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## List of Abbreviations

### Institutes in Bonn

PI	Physikalisches Institut Nussallee 12, 53115 Bonn
HISKP	Helmholtz-Institut für Strahlen- und Kernphysik Nussallee 14-16, 53115 Bonn
IAP	Institut für Angewandte Physik Wegelerstr. 8, 53115 Bonn
AlfA	Argelander-Institut für Astronomie Auf dem Hügel 71, 53121 Bonn

MPIfR Max-Planck-Institut für Radioastronomie  
Auf dem Hügel 69, 53121 Bonn

### Institutes in Cologne

I. PI	I. Physikalisches Institut
II. PI	II. Physikalisches Institut
IKP	Institut für Kernphysik
THP	Institut für Theoretische Physik

Zülpicher Str. 77, 50937 Köln

### Rooms

SR	Seminar Room
CR	Conference Room
KOSMA	KOSMA Room
Lib	Library
LH	Lecture Hall



Video Conference

# BCGS Courses

## Lectures

physics751



Group theory  
We 16-19, SR I, HISKP, Bonn  
Exercises: 2 hrs in groups  
The lecture is broadcasted to Cologne:  
We 16-18.30, SR THP

E. Epelbaum, S. Krewald

physics631



Quantum Optics  
Tu 10-12, Th 14-16, Bonn  
Exercises: 1hr in groups  
The lecture is broadcasted to Cologne:  
Tu 10-12, Th 14-16, SR II. Pl

M. Weitz

6813



Ultracold Atoms and Optical Lattices  
(A Playground for Quantum Manyparticle Systems)  
We 8-10, SR I, HISKP, Bonn  
The lecture is broadcasted to Cologne:  
We 8-10, SR THP

D. Meschede, F. Vewinger,  
A. Widera

## Seminars

physics  
6202

Joint Bonn - Cologne Seminar on Physics  
of Detectors for Particles, Nuclei and Radiation  
in turn  
Mo 11.15-12.45, room 300 Pl, Bonn  
Mo 11-12.30, Lib IKP, Cologne

F. Klein, K. Desch, J. Jolie

Research Internships  
Students become a temporary member of a research group for a typical  
duration of four weeks,  
Further information: <http://www.gradschool.physics.uni-bonn.de>,  
for similar courses, see:

physics717

High Energy Physics Lab, Bonn  
4 to 6 weeks on agreement

E. von Törne

## BCGS Courses

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physics732	Optics Lab, Bonn 4 to 6 weeks on agreement	K. Buse, M. Fiebig, D. Meschede, F. Vewinger, M. Weitz
184	Miniforschung (Ferienarbeit für Studierende mittlerer Semester), Cologne	Professors and Lecturers of the Physics Institutes
	Intensive Course	
	Workshop on Particle Physics at the Energy Frontier see page 13	E. von Törne

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## General Courses

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6826	Advanced Physics Laboratory , Part I 8 hrs in groups, Bonn K. Peithmann and staff	U. Blum, W. Hilert, R. Jahn,
6132	Das Weltbild der modernen Physik Tu 14-15.30, LH I, Cologne	T. Nattermann
6141	Elektrosmog Th 10-11.30, SR II. Pl, Cologne	J. Hemberger
6184	Presentation of Research Groups, We 10-11.30, biweekly, LH III, Cologne, first event: 16/04/09	Professors and Lecturers of the Physics Institutes

# Particle and Nuclear Physics

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physics632	Physics of Hadrons Mo 11, Tu 8-10, SR I, HISKP, Bonn Exercises: 1 hr in groups	R. Beck, K.-T. Brinkmann
physics633	High Energy Collider Physics Tu 12-14, Th 8-10, LH, IAP, Bonn Exercises: 1 hr in groups	J. Kroseberg
physics636	Advanced Theoretical Particle Physics Tu 14-16, Th 12, LH I, PI, Bonn Exercises: 2 hrs in groups	M. Drees
physics637	Advanced Theoretical Hadron Physics Tu 10-12, We 9, SR II, HISKP, Bonn Exercises: 2 hrs in groups	U. Meißner, A. Rusetzki
physics712	Advanced Electronics and Signal Processing We 10, Fr 10-12, SR II, HISKP, Bonn Exercises: 1 hr in groups	K. Desch, H. Krüger, A. Kruth
physics713	Particle Detectors and Instrumentation Mo 14-16, We 14, CR II, PI, Bonn Exercises: 1 hr in groups	R. Beck, H. Schmieden
physics714	Advanced Accelerator Physics We 10-12, LH, IAP, Th 10-12, SR I, HISKP, Bonn Lecture on 16.04.2009 in LH, HISKP Exercises: 1 hr in groups	W. Hillert, R. Maier
physics716	Statistical Methods of Data Analysis Mo 8-10, LH, IAP, Bonn Exercises: 2 hrs in groups	M.A. Pleier
physics718	C++ Programming in High Energy Physics We 8-10, LH, IAP, Bonn Exercises: 1 hr in groups	E. von Törne

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## Particle and Nuclear Physics

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physics753	Theoretical Particle Astrophysics Mo 12-14, We 13, LH I, PI, Bonn Exercises: 2 hrs in groups	S. Förste, H.-P. Nilles
physics755	Quantum Field Theory We 10-12, Fr 12, LH, HISKP, Bonn Exercises: 2 hrs in groups	H. Dreiner
6804	Advanced Topics in String Theory We 8, HS1, PI, Thu 13-15, LH, HISKP, Bonn	A. Klemm
6810	Reaktorphysik/Reactor Physics We 16-18, SR II, HISKP, Bonn	A. Gillitzer, R. Jahn
6157	Particle Physics 3 hrs on agreement, SR IKP, Cologne	M. Büscher, D. Gotta, H. Ströher
6164	Nuclear Structure Physics II 2 hrs Mo 14-15.30, SR IKP, Cologne	J. Jolie
6181	Physics of Detectors 3 hrs Mo 16-16.45, We 10-11.30, SR IKP, Cologne	A. Zilges
6182	Modern Experiments in Nuclear Physics 2 hrs Fr 14-15.30, SR IKP, Cologne	J. Jolie
6198	Advanced Seminar on Nuclear Physics 2 hrs We 14-15.30, SR IKP, Cologne	M. Büscher, J. Jolie, P. Reiter, A. Zilges, H. Ströher, D. Gotta, A. Dewald, K.O. Zell
6205	Advanced Seminar on Heavy Ion Physics 2 hrs Fr 14-15.30, Lib IKP, Cologne	P. Reiter

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# Astronomy and Astrophysics

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6931	Astrophysics of galaxies Mo 15-18, R. 1.11, Bonn Exercises: 2 hrs in groups	P. Kroupa, H. Baumgardt
astro822	Physics of the interstellar medium Tu 16-19, LH Astronomy, Bonn Exercises: 1 hr in groups	U. Klein, J. Kerp
astro844	Introduction to galactic and extragalactic X-ray astronomy Fr 13-15, R. 1.11, Bonn	T. Reiprich
astro845	Observational cosmology We 11-13, LH 0.01, MPIfR, Bonn Exercises: 1 hr in groups	F. Bertoldi, C. Porciani
astro846	Wave optics and astronomical applications We 15.30-17, LH 0.02, MPIfR, Bonn	G. Weigelt
astro847	Optical observations details to be announced	M. Geffert, T. Erben
astro851	Stellar and solar coronae Thu 9-10.30, MPIfR, HS 0.01, Bonn Exercises 1hr in groups	M. Massi
astro852	Gravitational lensing Tu 10-12, LH Astronomy, Bonn Exercises: 1 hr in groups	P. Schneider
astro858	Nucleosynthesis Bonn	N. Langer
astro891	Seminar on modern cosmology Mo 11-13, R. 1.11, Bonn	P. Schneider and staff

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## Astronomy and Astrophysics

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astro892	Seminar on radio astronomy Th 14, R. 1.11, Bonn	J.K. Jørgensen, F. Bertoldi, U. Klein
astro893	Seminar on star clusters and dwarf galaxies Fr 14-16, R. 3.19, Bonn	H. Baumgardt, P. Kroupa
astro894a	Seminar on theoretical stellar dynamics Fr 9-11, R. 3.19, Bonn	P. Kroupa, H. Baumgardt
astro894b	Seminar on cosmology and selected problems in gravitational lensing research Tu 14-16, R. 3.19, Bonn	P. Schneider and staff
6936	Wave Optics and Astronomical Applications We 15.30-17, LH 0.02, MPIFR, Bonn	G. Weigelt
6158	Physik aktiver Galaxienkerne 2 hrs We 12-13.30, SR I, PI, Cologne	A. Eckart, A. Zensus, S. Britzen
6166	Relativity and Cosmology I 4 hrs Tu & Fr 10-11.30, SR THP, Exercises: 2 hrs We 12-13.30, SR THP, Cologne	C. Kiefer
6167	Star Formation 2 hrs Th 12-13.30, LH II, Cologne	P. Schilke
6172	Inertial Confinement Fusion 3 hrs Mo 8-9.30 and on agreement, SR I, PI, Cologne	S. Pfalzner
6173	Exoplanets 3 hrs We 8-9.30 and on agreement, SR I, PI, Cologne	S. Pfalzner
6175	Astrochemistry 2 hrs We 8-9.30, SR IKP, Cologne	T. Giesen, S. Thorwirth

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6176	Molecular Physics II 3 hrs Mo 10-11.30, Tu 12, SR I. PI, Exercises: 1 hr Tu 13, SR I. PI, Cologne	T. Giesen, O. Baum, S. Thorwirth
6177	Atomic Physics II 3 hrs Tu 10, SR IKP, Fr 12-13.30, LH III, Cologne	R. Schieder
6199	Advanced Seminar on Current Problems in Physics and Astrophysics 2 hrs Mo 16-17.30, SR I. PI, Cologne	A. Eckart, R. Schieder, S. Schlemmer, J. Stutzki
6204	Advanced Seminar on Current Problems in Theoretical Astrophysics 2 hrs Tu 8.30-10, SR I. PI, Cologne	S. Pfalzner
6207	Advanced Seminar on Nuclear Astrophysics 2 hrs Tu 14-15.30, SR IKP, Cologne	A. Zilges, J. Hasper

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## Condensed Matter and Statistical Physics, Photonics

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physics634	Magnetism and Superconductivity Th 12, Fr 10-12, LH, IAP, Bonn Exercises: 1 hr in groups	K. Maier
physics635	Laser Spectroscopy Tu 8-10, Th 10-12, LH, IAP, Bonn Exercises: 1 hr in groups	F. Vewinger
physics638	Advanced Theoretical Condensed Matter Physics Tu 12, Fr 8-10, LH I, PI, Bonn Exercises: 2 hrs in groups	J. Kroha

## Condensed Matter and Statistical Physics, Photonics

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physics771	Environmental Physics & Energy Physics Selected Topics from "Physics & Energy" Transport & Storage of Energy Th 13.30-15, LH 118, AVZ I, Bonn	B. Diekmann , T. Reichelt
physics773	Physics in Medicine II: Fundamentals of Medical Imaging Mo 9-11, We 12, SR I, HISKP, Bonn Exercises: 1 hr in groups	K. Lehnertz
6151	Quantum Field Theory I 4 hrs Mo & We 12-13.30, LH III Exercises: 2 hrs Tu 14-15.30, CR THP, Cologne	M. Vojta
6155	Quantum Field Theory III 4 hrs Mo 14-15.30, Tu 12-13.30, LH III Exercises: 2 hrs We 10-11.30, SR I. PI, Cologne	A. Altland
6156	Solid State Physics III 3 hrs We 10-11.30, SR IKP, Fr 10, SR I. PI, Cologne	M. Braden
6160	Optical Spectroscopy of Solids 2 hrs Mo 12-13.30, LH II,	M. Grüninger
6163	Experimental Methods in Solid State Physics 2 hrs Tu 12-13.30, SR II. PI, Cologne	J. Hemberger
6165	Laser in der Medizin 3-Tage Blockkurs in den Semesterferien, Informationen und Anmeldung unter kessler@rheinahrcampus.de	B. Kessler
6168	Nanoelektronische Materialien 2 hrs We 14-15.30, LH I, Cologne	H. Kohlstedt, Ch. Buchal
6169	Statistical and Biological Physics 4 hrs We 12-13.30, CR THP, Fr 12-13.30, SR THP, Exercises: 2 hrs Tu 12-13.30, SR THP, Cologne	M. Lässig

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6171	Physics of Information and Nano-Technology II 2 hrs Tu 14-15.30, SR II. PI, Cologne	R. Wördenweber
6174	Quantum Liquids 2 hrs Fr 14-15.30, SR II. PI, Cologne	J. Röhler
6180	Praktische Quantenmechanik für die experimentelle Festkörperphysik 2 hrs Mo 12-13.30, SR II. PI, Exercises: 1 hr Fr 11, SR I. PI, Cologne	L.H. Tjeng
6191	Advanced Seminar "Beyond equilibrium: how to violate the second law" 2 hrs Th 12-13.30, SR THP, Cologne	A. Altland, R. Egger, A. de Martino M. Vojta
6192	Advanced Seminar on Current Problems in Solid State Physics 2 hrs Mo 14-15.30, SR II. PI, Cologne	M. Abd-Elmeguid, M. Braden, M. Grüninger, T. Michely, L.H. Tjeng
6194	Preparation for Advanced Seminar: "Beyond equilibrium...." 4 hrs on agreement, THP, Cologne	A. Altland, R. Egger, A. de Martino, M. Vojta
6196	Advanced Seminar: Magnetism and Spintransport in Nanostructures We 14-15.30, SR II. PI, Cologne	D. E. Bürgler, P. Grünberg, L.H. Tjeng
6200	Seminar on Biological Physics 2 hrs We 16-17.30, CR THP, Cologne	M. Lässig

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# Poster Session: Insights into the research projects of the BCGS-members

Once a year, BCGS-students present their scientific work in a poster session providing insights into their research projects.

The next session will take place

9 June 2009, 16 h  
Foyer of the Wolfgang-Paul-Hörsaal  
Kreuzbergweg 28 in 53115 Bonn

Additionally, there will be a Colloquium talk at 15 h in Wolfgang-Paul-Hörsaal,

Speaker: Prof. Dr. Martin Zirnbauer, University of Cologne

Title to be announced

We cordially invite all interested students and faculty to discuss at the posters and the informal get-together after the talk

# Workshop on Particle Physics at the Energy Frontier

28 September - 2 October 2009

Full-Day workshop with lectures and hands-on exercises

<http://www.uni-bonn.de/~etoerne/teaching/intensive-week09>

Please see web site for registration deadline

## Topics

- \* Introduction to Particle Physics
- \* Hadron Collider Physics
- \* Higgs bosons and other heavy particles
- \* Statistics and Discoveries: How to discover a new particle species

The course is intended both for master and Ph.D. students. An introductory lecture in particle or nuclear physics is helpful to follow the lectures.

Notes











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