



universität**bonn**

Universität zu Köln



Bonn-Cologne Graduate School
of Physics and Astronomy

Course Overview

Winter Term 2011/2012

bcgs



weekly schedule



Time frame for the coordinated studies programme at Bonn (B) and Cologne (C). The marked areas indicate scheduling of the most attractive courses for students from the partner institution. Fridays are reserved for early integration into research groups.

BCGS Course Overview

Winter Term 2011/2012

This list of courses provides an overview of lectures and seminars offered within the Master and Diploma course programmes in Bonn and Cologne.

Certain courses are assigned as “Special BCGS Courses” such as joined courses given by lecturers from both universities, courses broadcasted to the other university by video conference, courses given as teaching exchange between both universities, or (lab) courses facilitating an early access into research. Courses of special relevance for students of the partner university have been scheduled within the BCGS time frame enabling students to travel to the partner university (see adjacent figure).

Further, you will find courses classified according to the three main research areas covered by the Graduate School: Particle and Nuclear Physics - Astronomy and Astrophysics - Condensed Matter and Statistical Physics, Photonics.

You may choose your personal curriculum with respect to your scientific interests within the terms of the corresponding Master programmes in Bonn and Cologne. In case you need any support do not hesitate to ask your mentors or the administration.

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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

Zùlpicher Str. 77, 50937 Köln

Rooms

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

Video Conference



Teaching Exchange



Joined Course




Special BCGS Courses

Lectures

physics611	Particle Physics Tu 13, LH I, PI, Th 16-18, LH, IAP, Bonn Exercises: 1 hr in groups	<i>F. Klein</i>
physics612	Accelerator Physics We 10-12, LH, IAP, Th 10-12, SR I, HISKP, Bonn Exercises: 1 hr in groups included	<i>W. Hillert, A. Lehrach, R. Maier</i>
physics614	Laser Physics and Nonlinear Optics Tu & Th 10-12, LH, IAP, Bonn Exercises: 1 hr in groups included	<i>D. Meschede</i>
physics615	 Theoretical Particle Physics Mo 10-12, Th 13, LH I, PI, Bonn The lecture is broadcasted to Cologne: Lib IKP Exercises: 2 hrs in groups	<i>H. Dreiner</i>
physics619	Applied Photonics Tu 12-14, Th 8-10, LH, IAP, Bonn Exercises: 1 hr in groups	<i>E. Soergel</i>
physics715	 Experiments on the Structure of Hadrons Mo 14-16, SR I, HISKP, Bonn The lecture is broadcasted to Cologne: Lib IKP Exercises: 1 hr in groups	<i>A. Gillitzer</i>
astro812	 Cosmology Mo 16-19, LH 0.02, MPIfR, Bonn Exercises: 1 hr in groups Lecture is broadcasted to Cologne: KOSMA	<i>P. Schneider, C. Porciani</i>
6185	Selected topics on present and future energy supply 2 hrs Mo 16-17.30, SR II, PI, Cologne	<i>A. Dewald</i>
6187	Advanced Solid State Theory 2 hrs Tu 12-13.30, SR IKP Tutorials: 1 hr Fr 12, SR IKP, Cologne	<i>M. Garst</i>

Special BCGS Courses

6189	 Superconductivity 2 hrs Mo 10-11.30, SR II, PI, Cologne Lecture is broadcasted to Bonn: SR I, PI	<i>M. Grüniger</i>
6190	Nuclear Physics II (nuclear structure and reactions) 3 hrs Mo 14, We 16-17.30, SR IKP, Cologne	<i>J. Jolie</i>
6191	Theoretical Nuclear Physics I - The Nuclear Shell Modell 2 hrs We 10-11.30, SR THP, Cologne	<i>J. Jolie</i>
6194	Probability theory and stochastic processes for physicists 3 hrs Mo 12, We 10-11.30, CR THP, Cologne	<i>J. Krug</i>
6198	Solid State Theory 3 hrs Mo 12-13.30, SR THP, We 16-17.30, SR I, PI, Cologne Exercises: 1 hr in groups every second week	<i>A. Rosch</i>

Due to technical support issues, lectures by video might be shifted to other rooms on short notice.
Please check the BCGS web site and local announcements.

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-koeln.de>,
for similar courses, see

physics717	High Energy Physics Lab, Bonn 4 to 6 weeks on agreement	<i>E. von Törne</i>
physics732	Optics Lab, Bonn 4 to 6 weeks on agreement http://www.iap.uni-bonn.de/opticslab/	<i>D. Meschede, F. Vewinger, M. Weitz</i>
6205	Miniforschung (Internship during semester break for advanced students), Cologne	<i>Professors and Lecturers of the Physics Institutes</i>

Seminars

6222	Seminar on Medical Applications of Physics 2 hrs We 10-11.30, SR IKP, Cologne	<i>A. Blazhev</i>
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Intensive Courses

physics719	BCGS Intensive Week (Advanced Topics in High Energy Physics) From Chips to Higgs: LHC Detectors and Physics in one week, Bonn 26.-30.09.2011	<i>N. Wermes and co-workers</i>
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physics737	BCGS Intensive Week (Advanced Topics in Photonics and Quantum Optics) Communication and Quantum Physics, Bonn 05.-09.03.2012	<i>D. Meschede</i>
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6183	BCGS Intensive Week: Numerical Methods for Many-Particle Systems, SR THP, Cologne 05.-09.03.2012	<i>R. Bulla, A. Mitchell</i>
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6202	BCGS Intensive Week: Experiments on Atomic Nuclei at their Extremes, SR IKP, Cologne 06.-10.02.2012	<i>W. Korten</i>
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Presentation of Research Groups

Presentation of Research Groups 2 hrs Fr 12:15-13.45, LH, IAP, Bonn and SR THP, Cologne (video conference)	<i>Professors and Lecturers of the Physics Institutes; contact: R. Bulla, E. von Törne</i>
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Introduction to the research groups in Bonn and Cologne.

The series will start in mid-November. Details will be announced on the BCGS web site.

In Bonn, this seminar is jointly organized together with the Fachschaft Physik (student union).

General Courses

physics606	Advanced Quantum Theory Mo 12-14, Th 12, LH I, PI, Bonn Exercises: 2 hrs in groups	<i>H.-W. Hammer</i>
physics607	Advanced Theoretical Physics Mo 12-14, Th 12, SR I, HISKP, Bonn Exercises: 2 hrs in groups	<i>A. Klemm</i>
physics760	Computational Physics We 10-12, SR II, HISKP, Bonn Exercises: 2 hrs in groups	<i>C. Urbach</i>
6173	Advanced Statistical Physics 4 hrs Tu 14-15.30, We 10-11.30, LH III, Cologne Exercises: 2 hrs Mo on agreement	<i>J. Berg</i>
6174	Advanced Quantum Mechanics 4 hrs Mo 10-11.30, Tu 8-9.30, LH III, Cologne Exercises: 2 hrs We on agreement	<i>A. Altland</i>
6197	Game theory & evolutionary game theory 2 hrs Mo 16-17.30, SR IKP, Exercises: 1 hr Mo 17:45-18.30, SR IKP, Cologne	<i>M. Porto</i>

Particle and Nuclear Physics

physics616	Theoretical Hadron Physics Tu 10-12, Th 9, SR II, HISKP, Bonn Exercises: 2 hrs in groups	<i>B. Kubis, U. Meißner, A. Rusetsky</i>
physics618	Physics of Particle Detectors Tu, Th 14-16, LH, IAP, Bonn Exercises: 1 hr included	<i>E. von Törne</i>
physics711	Particle Astrophysics and Cosmology Mo 15, LH I, PI, Fr 8-10, LH, IAP, Bonn Exercises: 1 hr in groups	<i>S. Böser, J. Dingfelder</i>

physics752	Superstring Theory Mo 9, SR I, HISKP, Tu 16-18, LH I, PI, Bonn Exercises: 2 hrs in groups	<i>S. Förste, H.-P. Nilles</i>
physics757	Effective Field Theories for Nuclear and Particle Physics Fr 10-13, SR II, HISKP, Bonn Exercises: 2 hrs in groups	<i>C. Hanhart, S. Krewald</i>
physics758	Quantum Chromodynamics We 14-17, SR II, HISKP, Bonn Exercises: 2 hrs in groups	<i>A. Nogga, A. Wirzba</i>
physics771	Energy and the Environment Tu 12-14, SR I, HISKP, Bonn	<i>H. Dreiner</i>
physics651	Seminar on Current Topics in Experimental Particle Physics Mo 11-13, room 300 PI, Bonn	<i>I. Brock, K. Desch, J. Dingfelder E. von Törne, N. Wermes</i>
physics653	Seminar on Theoretical Hadron Physics Tu 14-16, SR II, HISKP, Bonn	<i>B. Kubis, U. Meißner, A. Rusetsky</i>
6182	Tools for Particle Physics 2 hrs on agreement, SR IKP, Cologne First meeting: We, 12.10.2011 @ 13h	<i>M. Büscher, D. Gotta, S. Schadmand, H. Ströher</i>
6225	Advanced Seminar on Nuclear Physics 2 hrs We 14-15.30, SR IKP, Cologne	<i>M. Büscher, D. Gotta, J. Jolie, P. Reiter, A. Zilges, H. Ströher, A. Dewald, S. Schadmand, K.O. Zell</i>
6229	Advanced Seminar in Radiation Physics 2 hrs Tu 16-17.30, SR IKP, Cologne First meeting: Tu, 11.10.2011 @ 16h	<i>J. Jolie</i>
6231	Advanced Seminar on Heavy Ion Physics 2 hrs Th 14-15.30, Lib IKP, Cologne First meeting: Th 13.10.2011 @ 14h	<i>P. Reiter</i>

Astronomy and Astrophysics

astro801	Introduction to astrophysics Details to be announced, Bonn Exercises arranged by appointment	<i>U. Klein</i>
astro811	Stars and stellar evolution Th 9-11, Fr 9, R. 0.006, Bonn Exercises arranged by appointment	<i>N. Langer</i>
astro841	Radio astronomy: tools, applications, and impacts Tu 16, Th 16-18, LH Astronomy, Bonn Exercises arranged by appointment	<i>U. Klein</i>
astro842	Submillimeter astronomy Th 11-13, LH 0.01, MPIfR, Bonn Exercises arranged by appointment	<i>K. Menten, F. Bertoldi</i>
astro853	The physics of dense stellar systems: the building blocks of the universe Tu 10-12, R. 3.010, Bonn Exercises arranged by appointment	<i>P. Kroupa</i>
astro854	Numerical gravitational dynamics Th 14-16, R. 0.006, Bonn Exercises arranged by appointment	<i>J. Pflamm-Altenburg</i>
astro855	Radio- and X-ray-observations of dark matter and dark energy Fr 13-15, R. 0.008, Bonn Exercises/lab course arranged by appointment	<i>J. Kerp, T. Reiprich</i>
astro856	Quasars and microquasars Th 13-15, LH 0.01, MPIfR, Bonn	<i>M. Massi</i>
astro857	Star formation We 10-12, LH 0.01, MPIfR, Bonn	<i>B. Parise, A. Stolte</i>
astro859	The cosmic history of the intergalactic medium Tu 11-12.45, LH Astronomy, Bonn	<i>C. Porciani</i>

astro891	Seminar on cosmology Tu 14-16, R. 3.010, Bonn	<i>P. Schneider, C. Porciani, T. Reiprich</i>
astro892	Seminar on radio astronomy Th 14-16, R. 0.008, Bonn	<i>U. Klein, F. Bertoldi, M. Kramer, M. Massi, K. Menten</i>
astro893	Seminar on stars, stellar systems, and galaxies Tu 16-18, R. 3.010, Bonn	<i>P. Kroupa, R. Izzard, J. Pflamm-Altenburg</i>
astro894	Seminar on astronomy and astrophysics Mo 14-15.30, LH Astronomy, Bonn	<i>T. Reiprich and colleagues</i>
6935	Practical radio interferometry We 13-16, R. 0.008, Bonn	<i>F. Bertoldi, M. Maercker, V. Smolcic, O. Wucknitz</i>
6938	Accretion in astrophysics: theory and applications Mo 14-16, Tu 10-12, R. 0.008, Bonn	<i>P. Podsiadlowski</i>
6939	Selected applications of general relativity in astrophysics Th 10-12, R. 0.008, Bonn	<i>O. Wucknitz</i>
6940	Physics of supernovae and gamma-ray bursts We 13.30-15, LH Astronomy, Bonn	<i>S. Yoon</i>
6952	Seminar on theoretical dynamics Fr 14-16, R. 3.010, Bonn	<i>P. Kroupa, J. Pflamm-Altenburg</i>
6953	Seminar on stellar evolution and hydrodynamics Th 13.30-15, R. 3.010, Bonn	<i>N. Langer, J. Braithwaite, R. Izzard</i>
6954	Seminar on galaxy clusters Th 15-16.30, R. 2.023, Bonn	<i>T. Reiprich, Y. Zhang</i>
6955	Seminar on selected problems in extragalactic astronomy and cosmology Th 16-18, R. 3.010, Bonn	<i>P. Schneider, C. Porciani</i>
6956	Seminar on strong gravitational lensing and lens modelling Fr 17-19, R. 3.010, Bonn	<i>O. Wucknitz</i>

Astronomy and Astrophysics

physics711	Particle Astrophysics and Cosmology Mo 15, LH I, PI, Fr 8-10, LH, IAP, Bonn Exercises: 1 hr in groups	<i>S. Böser, J. Dingfelder</i>
6186	Astrophysics II 4 hrs Tu 10-11.30, Th 12-13.30, SR I. PI, Cologne Exercises: 1 hr on agreement	<i>A. Eckart, L. Labadie</i>
6188	Molecular Physics I 3 hrs Mo 12-13.30, Tu 12-12:45, SR I. PI, Cologne Problem Class: 1 hr Tu 13-13:45, SR I. PI	<i>T. Giesen</i>
6193	Relativity and Cosmology II 4 hrs Mo 16-17.30, SR THP, We 10-11.30 SR I. PI Exercises: Th 12-13.30, SR I. PI, Cologne	<i>C. Kiefer</i>
6196	Star Formation 2 hrs Mo 8-9.30, CR THP, Cologne	<i>S. Pfalzner</i>
6200	Experiments in Molecular Physics 2 hrs Fr 10-11.30, SR I. PI, Cologne	<i>S. Schlemmer</i>
6226	Advanced Seminar on Current Problems in Physics and Astrophysics 2 hrs Mo 14-15.30, SR I. PI, Cologne First meeting: Mo, 17.10.2011 @ 14h	<i>A. Eckart, L. Labadie, P. Schilke, S. Schlemmer, J. Stutzki</i>
6228	Advanced Seminar on Relativity and Cosmology 2 hrs Tu 14-15.30, SR THP, Cologne First meeting: Tu, 11.10.2011 @ 14h	<i>C. Kiefer</i>

Condensed Matter and Statistical Physics, Photonics

physics613	Condensed Matter Physics We 10-12, Fr 9, SR I, HISKP, Bonn Exercises: 1 hr in groups	<i>P.-D. Eversheim, R. Vianden</i>
physics617	Theoretical Condensed Matter Physics We 13, Fr 13-15, LH I, PI, Bonn Exercises: 2 hrs in groups	<i>H. Monien</i>
physics739	Lecture on Advanced Topics in Photonics: Ultrashort Laser Pulses We 14-16, LH, IAP, Bonn Exercises: 1 hr in groups	<i>F. Vewinger</i>
physics740	Hands-on Seminar: Experimental Optics and Atomic Physics Mo 9-11 or Mo 11-13, laboratories of the research group, IAP, Bonn Kick-Off: Mo, 10.10.2011 @ 9h, CR, IAP	<i>M. Weitz</i>
physics772	Physics in Medicine I: Fundamentals of Analyzing Biomedical Signals Mo 10-12, We 12, SR I, HISKP, Bonn Exercises: 1 hr in groups	<i>K. Lehnertz</i>
physics652	Seminar on Key Experiments in Modern Atomic, Molecular, and Optical Physics Mo 14-16, LH, IAP, Bonn	<i>D. Meschede, F. Vewinger</i>
physics656	Computational Physics Seminar on Analyzing Biomedical Signals Mo 14-16, SR II, HISKP, Bonn	<i>K. Lehnertz, B. Metsch</i>
6178	Synchrotron Radiation in Solid State Research 2 hrs Th 10-11.30, SR II, PI, Cologne	<i>M. Abd-Elmeguid</i>

Condensed Matter and Statistical Physics, Photonics

6179	Quantum Field Theory II 4 hrs We 12-13.30, Fr 10-11.30, SR THP, Exercises: 2 hrs Tu 16-17.30, SR I. PI, Cologne	<i>A. de Martino</i>
6181	Introduction to Neutron Scattering 2 hrs Fr 12.30-14, R. 338 II. PI, Cologne	<i>M. Braden</i>
6195	Condensed Matter Physics I 3 hrs Tu 10-11.30, Fr 10-10.45, SR II. PI, Exercises: 1 hr Fr 11-11.45, SR II. PI, Cologne	<i>T. Lorenz</i>
6199	High Temperature Superconductors 2 hrs Fr 14-15.30, SR II. PI, Cologne	<i>J. Röhler</i>
6201	Introduction to Biophysics 4 hrs Mo 14-15.30, We 14-15.30, CR THP, Exercises: 2 hrs We 16-17.30, CR THP, Cologne Lecture starts on 17.10.2011	<i>B. Maier</i>
6206	Scattering Methods for Condensed Matter Research: Towards Novel Applications at Future Sources 43rd IFF-Spring School, 5.-16. March 2012 see: http://www.iff-springschool.de	<i>P.S. Bechthold, C. Buchal, D. E. Bürgler, G. Gompper, P. Grünberg, R. Wördenweber</i>
6221	Seminar on Statistical Biology 2 hrs Th 12-13.30, CR THP, Cologne First meeting: Th, 13.10.2011 @ 12h	<i>J. Berg, J. Krug, M. Lässig</i>
6223	Advanced Seminar on Current Problems in Solid State Physics: 100 Years of Superconductivity 2 hrs Mo 14-15.30, SR II. PI, Cologne	<i>M. Braden, M. Grüninger, T. Michely, J. Hemberger, T. Lorenz</i>

BCGS Grand Opening

We invite all BCGS members to our welcome party for our new students. The festive event to open the new academic year will take place

November 25th, starting around 3 p.m.

Lecture Hall

Wegeler Str. 10 in 53115 Bonn

Speaker: Professor Serge Haroche (Collège de France, Paris)

The complete programme will be presented on our webpage before long.



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