

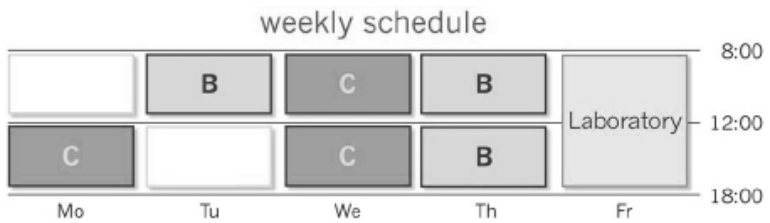
Bonn-Cologne Graduate School  
of Physics and Astronomy



# Course Overview

Winter Term 2016/2017





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 2016/2017

This list of courses provides an overview of lectures and seminars offered within the Master 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
  
- THP NB - Neubau Institut für Theoretische Physik  
Zùlpicher Str. 77a, 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

physics614	Laser Physics and Nonlinear Optics Tu 10-12, Th 8-10, LH, IAP, Bonn Exercises: 1 hr in groups included Lecture will be recorded. For access, please contact <a href="mailto:vewinger@iap.uni-bonn.de">vewinger@iap.uni-bonn.de</a>	F. Vewinger
		
physics615	Theoretical Particle Physics Mo 16-18, Tu 16, LH I, PI, Bonn Exercises: 2 hrs in groups	H.P. Nilles
physics620	Advanced Atomic, Molecular and Optical Physics Tu 14-16, We 14-16, LH, IAP, Bonn Exercises: 1 hr in groups included	F. Vewinger
astro811	Stars and Stellar Evolution specific: Stellar Structure and Evolution Th 9-11, R 0.012, AlfA, Fr 8.45-9.45, CIP-Pool, AlfA, Bonn Exercises: 1 hr in groups	N. Langer, R. Stancliffe
astro812	Cosmology Tu 10-13, R 0.012, AlfA, Bonn Exercises: 1 hr in groups	H. Hildebrandt, P. Schneider
astro8503	Radio and x-ray observations of dark matter and dark energy Fr 13-15, R 0.008, AlfA, Bonn Exercises/lab course arranged by appointment	T. Reiprich, Y. Zhang
14756.2016	Introduction to Biophysics 4 hrs Mo 14-15.30 SR IKP, We 14-15.30 SR THP Exercises: 2 hrs We 16-17.30, SR THP, Cologne	B. Maier
14756.2018	Nuclear Physics II (Nuclear Structure and Reactions) 3 hrs We 10, Fr 10-11.30, SR IKP, Cologne	J. Jolie

## Special BCGS Courses

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14756.2028	Quantum Gravity 2 hrs lectures Th 10-11.30, SR THP NB, Cologne	C. Kiefer
14756.2034	Probability Theory and Stochastic Processes for Physicists 2 hrs lectures We 10-11.30, CR2 THP NB, Exercises: 1 hr We 12, CR2 THP NB, Cologne	D. Witthaut
14756.2039	Accelerator Physics and Accelerator Mass Spectroscopy 2 hrs lectures We 16-17.30, SR IKP, Cologne	A. Dewald

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

If you are interested in a specific course but are unable to travel, please inquire if video broadcast is possible.

### 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

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physics717	High Energy Physics Lab, Bonn 4 to 6 weeks on agreement	E. von Törne
physics732	Optics Lab, Bonn 4 to 6 weeks on agreement <a href="http://www.iap.uni-bonn.de/opticslab/">http://www.iap.uni-bonn.de/opticslab/</a>	F. Vewinger, M. Köhl, S. Linden, D. Meschede, M. Weitz
53199	Miniforschung (Internship during semester break for advanced students), Cologne	Professors and Lecturers of the Physics Institutes

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## Intensive Courses

physics719	BCGS Intensive Week (Advanced Topics in High Energy Physics): From Hits to Higgs - a Discovery Simulation for Physics at the LHC, Bonn October 10-14, 2016, for more information see <a href="https://www.hep1.physik.uni-bonn.de/teaching/intensiveweek/index">https://www.hep1.physik.uni-bonn.de/teaching/intensiveweek/index</a>	E. von Törne
	BCGS Intensive Week: Experiment and Simulation on Biological Systems Cologne, March 6-10, 2016 Please note: number of participants is limited. Information on application will be published soon on: <a href="http://www.biophysics.uni-koeln.de/">http://www.biophysics.uni-koeln.de/</a>	J. Berg, B. Maier

## General Courses

physics606	Advanced Quantum Theory Mo 10-12, We 13, LH I, PI, Bonn Exercises: 2 hrs in groups	C. Hanhart, B. Kubis
physics751	Group Theory Tu 14-16, Th 13, LH I, PI, Bonn Exercises: 2 hrs in groups	S. Förste
physics760	Computational Physics Tu 10-12, SR I, HISKP, Bonn Exercises: 2 hrs in groups	C. Urbach
physics774	Electronics for Physicists Tu 14, We 10-12, LH, HISKP, Bonn Exercises: 1 hr in groups	P.-D. Eversheim
6839	Public Presentation of Science 2 hrs on agreement, Bonn	H. Dreiner

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14756.2000	Advanced Statistical Physics 4 hrs Tu 12-13.30, Th 10-11.30, LH III, Cologne Exercises: 2 hrs Mo on appointment	M. Sperl
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14756.2002	Advanced Quantum Mechanics 4 hrs Mo 10-11.30, Tu 8-9.30, LH III, Cologne Exercises: 2 hrs We on appointment	J. Krug
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## Particle and Nuclear Physics

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physics611	Particle Physics Tu, Th 12-14, LH, IAP, Bonn Lecture times will be synchronized with those of physics618 on October 20, 2016 Exercises: 1 hr in groups included	I. Brock
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physics618	Physics of Particle Detectors Th 14-16, Fr 13-15, LH, HISKP, Bonn Lecture times will be synchronized with those of physics611 on October 20, 2016 Exercises: 1 hr in groups	N. Wermes
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physics616	Theoretical Hadron Physics We 14-17, SR I, HISKP, Bonn Exercises: 2 hrs in groups	T. Luu, A. Wirzba
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physics711	Particle Astrophysics and Cosmology Mo 14-16, Tu 10-12, LH, HISKP, Bonn Exercises: 1 hr in groups included	Ph. Bechtle, M. Christinziani
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physics715	Experiments on the Structure of Hadrons We 14-16, SR II, HISKP, Bonn Exercises: 1 hr in groups	A. Gillitzer
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physics7501	Advanced Quantum Field Theory We 10-12, Th 9, SR II, HISKP, Bonn Exercises: 2 hrs in groups	A. Rusetsky
physics752	Superstring Theory Th 12, LH I, Pl, Fr 10-12, LH, HISKP, Bonn Exercises: 2 hrs in groups	A. Klemm
physics753	Theoretical Particle Astrophysics Mo 12-14, Tu 9, LH, HISKP, Bonn Exercises: 2 hrs in groups	M. Drees
14756.2009	Tools for Particle Physics 2 hrs on appointment, SR IKP, Cologne	D. Gotta, H. Ströher, mit M. Hartmann und I. Keshalashvili
14756.2033	Selected Topics of Modern Nuclear Physics 2 hrs Tu 10-11.30, SR IKP, Cologne	P.Reiter
14756.5001	Specialized Seminar on Nuclear Physics 2 hrs, Th 10-11.30, SR IKP, Cologne	J. Jolie
14756.5004	Advanced Seminar on Nuclear Physics 2 hrs We 14-15.30, SR IKP, Cologne	D. Gotta, J. Jolie, A. Zilges, P. Reiter, H. Ströher, A. Dewald, mit M. Hartmann und I. Keshalashvili
14756.5007	Advanced Seminar on Nuclear Physics with Stored Ions 2 hrs, Mo 14-15.30, Lib IKP, Cologne	A. Blazhev
14756.5008	Advanced Seminar on Data Analysis of Gamma Spectroscopic Measurements 2 hrs, every 2 weeks Fr 15-16.30, Lib IKP, Cologne	A. Dewald
14756.5011	Advanced Seminar on Projects related to AMS Measurements and Developments 2 hrs, every 4 weeks, Th 10-11.30, Lib IKP, Cologne	A. Dewald with E. Strub, T. Dunai, J. Rethemeyer

# Astronomy and Astrophysics

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astro608	Theoretical Astrophysics We 12, Th 11-13, R 0.012, AlfA, Bonn Exercises: 2 hrs in groups	C. Porciani
astro801	Introduction to Astrophysics Details to be announced, Bonn	P. Schneider
astro841	Radio astronomy: tools, applications and impacts Tu 16, Th 16-18, R 0.012, AlfA, Bonn Exercises arranged by appointment	U. Klein
astro8531	The Physics of Dense Stellar Systems Mo 15-18, R 0.012, AlfA, Bonn Exercises arranged by appointment	P. Kroupa
astro854	Numerical Dynamics Th 14-16, R 0.008, AlfA, Bonn Exercises arranged by appointment	J. Pflamm-Altenburg
astro856	Quasars and microquasars Th 13-15, R 0.01, MPIfR, Bonn	M. Massi
astro830	Seminar on astronomy and astrophysics Mo 14-15.30, R 0.008, AlfA, Bonn	Astronomy Professors and Lecturers
6952	Seminar on theoretical dynamics Fr 14-16, R 3.010, AlfA, Bonn	P. Kroupa, J. Pflamm-Altenburg
6953	Seminar on stellar evolution and hydrodynamics Th 13.30-15, R 3.010, AlfA, Bonn	N. Langer
6954	Seminar on galaxy clusters Th 15-17, R 0.006, AlfA, Bonn	T. Reiprich, Y. Zhang
6955	Seminar on selected problems in extragalactic astronomy and cosmology Th 16-18, R 3.010, AlfA, Bonn	C. Porciani, P. Schneider

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6959	Seminar on cosmology Tu 14-16, R 3.010, AlfA, Bonn	P. Schneider, C. Porciani, T. Reiprich
6960	Seminar on radio astronomy Th 18-19, R 0.012, AlfA, Bonn	F. Bertoldi, J. Kerp, U. Klein, M. Kramer, M. Massi, K. Menten
6961	Seminar on stars, stellar systems, and galaxies Tu 16-17.30, R 3.010, AlfA, Bonn	P. Kroupa, J. Pflamm-Altenburg
physics711	Particle Astrophysics and Cosmology Mo 14-16, Tu 10-12, LH, HISKP, Bonn Exercises: 1 hr in groups included	Ph. Bechtle, M. Christinziani
physics753	Theoretical Particle Astrophysics Mo 12-14, Tu 9, LH, HISKP, Bonn Exercises: 2 hrs in groups	M. Drees
14756.2007	Advanced Astrophysics 4 hrs We 12-13.30, Fr 16-17.30, SR I. PI, Cologne Exercises: 2 hrs Tu 10-11.30 on appointment	L. Labadie
14756.2013	Measurement Techniques in Molecular Physics 2 hrs Th 12-13.30, CR THP, Cologne	A. Kiendler-Scharr
14756.2021	Molecular Physics I 3 hrs Tu 14-15.30, Fr 14, SR I. PI, Problem Class: 1 hr Fr 15 SR I. PI, Cologne	S. Schlemmer
14756.2025	Formation of the Solar System 2 hrs Mo 8-9.30, CR THP, Cologne	S. Pfalzner
14756.5003	Advanced Seminar on Relativity and Cosmology 2 hrs Tu 10-11.30, CR 1 THP NB, Cologne	C. Kiefer
14756.5005	Advanced Seminar in Astrophysics 2 hrs Mo 14-15.30, SR I. PI, Cologne	A. Eckart, L. Labadie, P. Schilke, S. Schlemmer, J. Stutzki, S. Walch-Gassner

# Condensed Matter and Statistical Physics, Photonics

physics613	Condensed Matter Physics Mo 12-14, We 10-12, LH, IAP, Bonn Exercises: 1 hr in groups included	S. Linden
physics617	Theoretical Condensed Matter Physics We 12, Th 10-12, LH, HISKP, Bonn Exercises: 2 hrs in groups	C. Kollath
physics738	Lecture on Advanced Topics in Quantum Optics Th 10-12, LH, IAP, Bonn Exercises: 1 hr in groups	A. Alberti, D. Meschede
physics740	Hands-on Seminar: Experimental Optics and Atomic Physics Mo 9-11, IAP, Bonn	M. Weitz and co-workers
physics7502	Random Walks and Diffusion Th 14-16, SR II, HISKP, Bonn Exercises: 1 hr in groups included	G. Schütz
physics7503	Selected Topics in Modern Condensed Matter Theory We 14, Fr 12-14, LH I, PI, Bonn Exercises: 2 hrs in groups	J. Kroha
physics772	Physics in Medicine I: Fundamentals of Analyzing Biomedical Signals Mo 10-12, We 12, SR I, HISKP, Bonn Exercises: 1 hr in groups	G. Ansmann, K. Lehnertz
physics776	Physics in Medicine III: Physics of Magnetic Resonance Imaging Tu 14-16, Th 16, SR II, HISKP, Bonn Exercises: 1 hr in groups, Th 17, SR II, HISKP	T. Stöcker
physics652	Seminar Photonics/Quantum Optics Mo 14-16, LH, IAP, Bonn	D. Meschede

physics655	Computational Physics Seminar on Analyzing Biomedical Signals Mo 14-16, SR I, HISKP, Bonn	K. Lehnertz, B. Metsch
14756.2004	Quantum Field Theory II 4 hrs Mo 12-13.30, We 8-9.30, CR1 THP NB, Exercises: 2 hrs Th 14-15.30, SR THP NB, Cologne	S. Diehl
14756.2011	Solid State Spectroscopy 2 hrs Mo 16-17.30, SR II. PI Exercises: 1 hr We 12, SR II. PI, Cologne First lecture: October 31, 2016	A. Grüneis
14756.2012	Condensed Matter Physics I 3 hrs Tu 10-11.30, Th 12-13.30, SR II. PI, Cologne Exercises: 1 hr in groups included	P. van Loosdrecht
14756.2013	Measurement Techniques in Molecular Physics 2 hrs Th 12-13.30, CR THP, Cologne	A. Kiendler-Scharr
14756.2017	Superconductivity 2 hrs Mo 10-11.30, SR II. PI, Cologne	M. Braden
14756.2019	High Temperature Superconductors 2 hrs Fr 14-15.30, SR II. PI, Cologne	J. Röhler
14756.2020	Solid State Theory 3 hrs lectures & 1 hr tutorial every second week Th 8-9.30, Fr 12-13.30, SR THP NB, Cologne	S. Trebst
14756.2021	Molecular Physics I 3 hrs Tu 14-15.30, Fr 14, SR I. PI, Problem Class: 1 hr Fr 15 SR I. PI, Cologne	S. Schlemmer
14756.2032	Low Dimensional Quantum Physics 2 hrs We 12-13.30, CR THP, Cologne Exercises: 2 hrs Tu 14-15.30, CR THP, every second week	J. Marino

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14756.5000	Advanced Seminar on Current Problems in Solid State Physics: Spin-orbit coupling, topology, and correlations 2 hrs Mo 14-15.30, SR II. PI, Cologne see: <a href="http://www.ph2.uni-koeln.de/679.html">http://www.ph2.uni-koeln.de/679.html</a>	Y. Ando, M. Braden, A. Grüneis, M. Grüninger, P. van Loosdrecht, T. Michely, J. Hemberger, T. Lorenz
14756.5002	Advanced Seminar on Statistical Biology 2 hrs Th 12-13.30, SR THP, Cologne	T. Bollenbach
	Topological Matter - Topological Insulators, Skyrmions and Majoranas 48th IFF-Spring School, 27.03. - 07.04.2017 see: <a href="http://www.iff-springschool.de">http://www.iff-springschool.de</a>	Y. Ando (Cologne) S. Blügel, Y. Mokrousov, T. Schäpers (FZJ)

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## BCGS Grand Opening

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

October 28th, 2016  
Lecture Hall II  
Zülpicher Str. 77 in 50937 Cologne

The colloquium talk will be given at 16.30 h by

Professor Udo Seifert, University of Stuttgart, on  
“Stochastic thermodynamics:  
From principles to the cost of precision”.





Universität Bonn  
Bonn-Cologne Graduate School  
of Physics and Astronomy  
Nussallee 14-16  
53115 Bonn  
Germany

Phone: +49 228 732534 & 734832  
Fax: +49 228 733474  
Email: [gradschool.physics@uni-bonn.de](mailto:gradschool.physics@uni-bonn.de)  
<http://www.gradschool.physics.uni-bonn.de>

Universität zu Köln  
Bonn-Cologne Graduate School  
of Physics and Astronomy  
Zùlpicher Str. 77  
50937 Köln  
Germany

Phone: +49 221 4703554  
Fax: +49 221 4706727  
Email: [gradschool.physics@uni-koeln.de](mailto:gradschool.physics@uni-koeln.de)  
<http://www.gradschool.physics.uni-koeln.de>