



**The International Workshop on  
Partial Wave Analyses and Advanced Tools for  
Hadron Spectroscopy**

Website: <https://pwa-athos2017.hiskp.uni-bonn.de>

Physikzentrum Bad Honnef,  
DE-53604 Bad Honnef, Germany,  
March 13<sup>th</sup> - 17<sup>th</sup>, 2017

## **Second and Final Circular**

The International Workshop on Partial Wave Analyses and Advanced Tools for Hadron Spectroscopy, PWA9/ATHOS4, is a combination of the 9th International Workshop on Pion-Nucleon Partial Wave Analysis and the Interpretation of Baryon Resonances and the 4th Workshop on Partial Wave Analysis Tools for Hadron Spectroscopy. It will take place at the Physikzentrum of the German Physical Society located in Bad Honnef, southeast of Bonn, Germany.

**This circular contains preliminary information on the content and schedule of the scientific program, directions on how to get to the Physikzentrum and an update on the social activities and the conference dinner.**

# Scientific Program

The workshop consists of a few **overview talks**, which summarize the progress and status in a given area, and **topical sessions**, which are organized by conveners. The workshop will be complemented by a series of **lectures** on the Sunday preceding the workshop, which are meant as an introductory or refresher course of the topics discussed later during the week.

## Topical sessions

Presentations in the topical sessions have a format of **20 min. talk + 10 min. discussion**. The overarching topics are:

- **Topic 1: Spectroscopy of baryons, light- and heavy-quark mesons**
  - Recent experimental results
  - Phenomenological analyses
  - Model-independent partial wave analysis and complete experiments
- **Topic 2: Tools and methods for partial-wave analysis**
  - Fit strategies
  - Model selection, significance, systematics
  - Databases
- **Topic 3: Theoretical constraints on amplitude analyses**
  - Unitarity and analyticity constraints
  - High-energy asymptotics from Regge theory and FESR
  - Low-energy EFT constraints
- **Topic 4: Hadron Spectroscopy: Lattice QCD and models**
  - Meson and baryon spectra
  - Scattering on the Lattice
- **Topic 5: Future directions and goals of hadron spectroscopy**
  - Global analysis
  - Upcoming experiments
  - Requests from theory and experiment
- **Topic 6: Impact of spectroscopy on other areas in particle physics**

Due to the numerous abstracts that have already been submitted, **three parallel sessions** have now been scheduled on Monday, Tuesday and Thursday afternoon. More details can be found in the timetable below.

## Overview talks

In addition to the above-mentioned topical sessions, the morning sessions of this workshop are reserved specifically for **Highlight- and Overview Talks**, having the more extensive time format of **35 minutes talk + 10 min. discussion**. Every presentation is intended to provide a broad overview of the “bigger picture” on a specific branch of our common field. The confirmed overview talks are:

- Stephan Paul - *Meson Spectroscopy*
- Tomasz Skwarnicki - *Heavy-flavor hadron spectroscopy*
- Ulrike Thoma - *Baryon Spectroscopy*
- Michael Döring - *Baryon Partial-Wave Analysis*
- Adam Szczepaniak - *Theoretical constraints for amplitude analyses*
- Roger Barlow - *Statistical analyses of data*
- Christian B. Lang - *Excited hadrons on the lattice*
- Simon Eidelman - *Future perspectives and directions of spectroscopy*

## Lectures

As a special feature of this workshop, a **series of three lectures is scheduled for Sunday 03/12/17, beginning at 14:00**. The lectures are intended as an introductory or refresher courses to overarching topics of the workshop. Although these presentations are targeted primarily at students and young post-graduate researchers, they can in fact be recommended to all people who wish to refresh their memory on a specific subject, or who just enjoy a good lecture. The lectures are:

- (i) Ian Aitchison - *S-matrix constraints in hadron phenomenology*
- (ii) Boris Grube - *Tools and methods in meson spectroscopy*
- (iii) Lothar Tiator - *Tools and methods in baryon spectroscopy*

## Workshop Timetable

Below, a timetable is provided for the workshop. Overview talks and lectures have already been assigned to their respective slots. For an up-to-date schedule of all topical talks, stay tuned to the conference webpage

<https://pwa-athos2017.hiskp.uni-bonn.de>.

# Timetable

March, 12<sup>th</sup>

March, 17<sup>th</sup>

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
9:00		U. Thoma M. Doering	S. Paul A. Szczepaniak	C. Lang T. Skwarnicki	S. Eidelman R. Barlow	Topical Plenary
10:30		Coffee	Coffee	Coffee	Coffee	Coffee
11:00		Topical Plenary	Topical Plenary	Topical Plenary	Topical Plenary	Topical Plenary
12:30	Arrival	Lunch	Lunch	Excursion to Cologne		
14:00	Lectures				Lunch	
14:30	I. Aitchison B. Grube L. Tiator	Topical Plenary	Topical Plenary		Topical Plenary	
16:00		Coffee	Coffee		Coffee	
16:30		Topical Parallel	Topical Parallel		Topical Parallel	
19:00		Reception	Dinner		Dinner	
19:30	Dinner			Boat trip & Conference dinner		
21:00	Open end	Open end	Open end		Open end	

## Directions: How to reach the Physikzentrum?

The conference venue will be the Physikzentrum Bad Honnef, located at the address

DPG Bad Honnef (**Google maps: “Elly-Hölterhoff-Böcking-Stiftung”**)  
Deutsche Physikalische Gesellschaft e. V.  
Hauptstrasse 5  
53604 Bad Honnef

The directions given in the following are a slightly updated version of the information provided by the German Physical Society, under the webpage

<http://www.dpg-physik.de/dpg/anfahrt/anfahrthonnef.html?lang=en&>.

A detailed map of the local area surrounding the Physikzentrum can be found further below. We provide directions for the three main methods of transportation.

Please note that, in case problems arise with getting to the Physikzentrum, an **emergency cell phone number can be found at the end of this circular**. This number will be contactable starting Sunday at 10:00.

### By Car

- **From the North:** Use the german freeway **A3** until you arrive at “Dreieck Heumar”. There, change to the **A59** in the direction of “Bonn/Köln Airport” or “Bonn Königswinter”. From then on, continue on the **A59** and stay on it when it changes into a smaller local road, called **B42**. Stay on this road until the exit “Rhöndorf”, where you leave it.  
From this exit on, follow the “Rhöndorfer Straße” to the “Hauptstraße”. Approximately 2 kilometers from the exit, you find the Physikzentrum Bad Honnef on the left.
- **From the South:** Use the freeway **A3** from Frankfurt in the direction of Cologne. Take the exit “Bad Honnef/Linz”. Follow the road for about 4 kilometers. Then, at the **first intersection that has traffic lights, turn right**. Then, follow the road through the valley to Bad Honnef. Once you arrive in Bad Honnef, head in the northern direction (cf. map). You should be able to find the Physikzentrum.

### By Train

The three most important starting points to reach the Physikzentrum via train are

- **From Cologne:** From the central railway station of Cologne (“Köln Hauptbahnhof”), a direct connection to Rhöndorf is possible, without transitions. The ride takes about 40 minutes and is possible with **RB**-trains (“RegionalBahn”). If in doubt, you can get additional advice from the information center of the German railway society (“DB Informationszentrum”).
- **From Frankfurt:** The connections are here very similar to the description on how to get from Frankfurt International Airport to Rhöndorf. More can be found below under the header “From Airport”.
- **From Bonn Hauptbahnhof (main railway station):** From Bonn central station, there exists a direct connection via trains of type **STR** (“Straßenbahn”) to Bad Honnef. The line is called **STR 66** and you have to use it into the direction of Bad Honnef. After 35 mins, get off the station “**Am Spitzenbach**”, which is situated very close to the Physikzentrum (cf. map).



Figure 1: This map provides a more detailed description of the close surroundings of the Physikzentrum. The precise location of the conference venue is marked.

The most important arrival possibilities are the tram station of the line **S66**, called “**Am Spitzenbach**”, as well as the station of the D(utsche) B(ahn) (i.e. German Railway Society), **DB Rhöndorf**.

For a description on how to arrive at the depicted area, see the main text.

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In case you arrive at Bonn central station using a long-distance train, you will get off the train on one of the train tracks that are above ground. However, please notice that the **STR**-trains **leave from tracks underground!** In order to find these tracks, leave your arrival-track using one of the stairs that take you to the subterranean area. Then, head towards the inner city area of Bonn, i.e. North/North-East. You should arrive at a small plaza. From there on, the tracks of the **STR**-trains should be visible/reachable using the signs.

Tickets can be bought at machines on the respective tracks. If in doubt, you can get advice in the information center of the German railway society (“DB Informationszentrum”), which can be found in the main building of the Bonn central station above (!) ground.

More information on train schedules, as well as the possibility to book tickets, can be found online on the webpage of the German railway society:

<http://www.deutschebahn.com/en/start/>.

## From Airport

We provide directions starting at the three most important international airports nearby.

- **From Frankfurt International Airport:** A railway station, called “Frankfurt am Main Flughafen Fernbahnhof” is built directly into the airport. Trains leave from a beautifully modernized building with an impressive glass ceiling. The directions provided by the signs on the airport are excellent. If in doubt, just ask the local airport personnel.

Once arrived at the railway station, head directly into the travel information center provided by the German Railway society (“DB Informationszentrum”). Here, book a train of type **ICE** for fast travels. Also, employees will help you with the planning of the train ride. There are three options available for reaching the Physikzentrum:

- (i) Take the ICE all the way to Cologne Central Station (“Köln Hauptbahnhof”). When in Cologne, switch to a regional train of type **RE** (“RegionalExpress”) which takes you directly to Bonn in about 10 minutes. From Bonn Central Station, proceed as described under the category “ByTrain”.
  - (ii) Take the ICE in the direction of Cologne, but get off the train at the station **Siegburg/Bonn**, which will be reached prior to Cologne! From Siegburg on, take a train from the line **STR 66** (“Straßenbahn”) directly to Rhöndorf. It is again advised to ask people in the local Railway information center for help and also book tickets personally.
  - (iii) Take the ICE and get off the train at **Koblenz Hbf**. From Koblenz on, you can take trains of type **RE** (“RheinExpress”) or **RB** (“RegionalBahn”) directly to Rhöndorf, without transitions.
- **From Airport Köln-Bonn:** This Airport does have an integrated railway station as well. It is called “Köln/Bonn Flughafen”. Directions to get there should be well provided by the applied signs and airport personnel. From there on, a train connection to Rhöndorf is possible. However, it is not direct. You need to take a train of type **S** (for instance, line S13) to the station **Troisdorf**. From there on, trains of type **RB** (“RegionalBahn”) can take you directly to Rhöndorf.
  - **From Düsseldorf Airport (DUS):** A railway station is built into the airport here as well. It is found relatively easily. In case of problems, ask the local airport personnel for directions. However, you should be aware of the fact that the local cabin railway (“SkyTrain”) of the Düsseldorf Airport has to be used in order to reach the above mentioned railway station.  
Once you are arrived at the latter destination, use a train of the type **RE** (“Regional-Express”), which can take you directly to Bonn Hauptbahnhof with zero transitions. However, when booking your tickets, remember to really make sure to use an RE that does not require transitions.  
Once arrived at Bonn, proceed as described under the category “ByTrain”.

## Taxi

You can also of course just use a taxi for the transport from Bonn Central Station to the Physikzentrum. The ride takes around 30 minutes to cover 18 kilometers, at a cost of roughly 25 €. The phone number of the “Taxi Bonn eG” is:

- +49 228 555555

In case you arrive at the DB station “Rhöndorf”, a taxi is also an alternative to cover the 2 kilometers to the Physikzentrum. Taxi companies from the Bad Honnef area can be called under:

- +49 2224 2222
- +49 2224 2121

## Social Activities and Conference Dinner

In order to continue a long tradition of this international workshop series, **Wednesday afternoon** is reserved for social activities, followed by a conference dinner. The program starts with the departure at

12:30 and an ensuing bus ride from the Physikzentrum to the inner city of Cologne.

The transport will take about 45 to 60 minutes, thus resulting in an estimated arrival around 13:15 to 13:30, in the area close to the Cologne cathedral. From there on, several possibilities for guided tours have been prepared.

However, even in case you do not plan to participate in any of these tours, the area surrounding the Cologne cathedral offers many nice possibilities to pass the time. Numerous Cafes and Restaurants are situated close to the Cologne cathedral. Another possibility within walking distance is the Rhine river, providing for the perfect environment for a nice stroll along its way through Cologne. There is also the chance to visit the Hohenzollern Bridge. From there one has a nice view over the banks of the Rhine river. Moreover, it provides the impressive sight of a very large number of [love locks](#) fixed on the railings over the years. Whatever your plans are, it is strongly recommended to bring a camera with you and take some pictures to capture the special Rheinland-ian flavor provided by Colognes center.

After the visit to the city of Cologne, at

18:30 another bus ride is scheduled to take everybody back to Bonn.

The estimated time of arrival is around 19:00 to 19:15. Then, the highlight of the social program will take place which consists of a

Boat Trip on the Rhine river, leaving Bonn in the South Direction.

Boarding will take place between 19:00 and 19:30. Once everybody is on board, the trip will start and take us through the beautiful and well preserved river banks in the “Mittelrhein” (middle of the Rhine) region. The

Conference Dinner will take place on the River Boat during the trip.

The boat trip is scheduled to stop at 23:30, arriving at a pier in Bad Honnef. From there on, the Physikzentrum will be in walking distance.

Please note that a lot **more details** on the plans for Wednesday (detailed timetable, maps, etc.) will be **provided within your conference bag**.

## Registration

Although the call for contributions has ended on Sunday 02/12/2017, we would like to draw your attention to the fact that

[registration is still possible at the conference website,](#)

and will be kept open until the last week before the workshop.



## Contact Information

Conference website : <https://pwa-athos2017.hiskp.uni-bonn.de>

Conference e-mail : [pwaathos2017-info@hiskp.uni-bonn.de](mailto:pwaathos2017-info@hiskp.uni-bonn.de)

Emergency cell-phone numbers : +49-163-7337813 or +49-163-7337814

### Conference Chairs

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**We are looking forward to welcoming you  
in Bad Honnef!**