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## 3rd Karl Schwarzschild Meeting - Gravity and the Gauge/Gravity Correspondence

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# 3rd Karl Schwarzschild Meeting – Gravity and the Gauge/Gravity Correspondence, 24–28 July 2017, Frankfurt am Main, Germany

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## 1. Preface

The Karl Schwarzschild Meeting 2017 (KSM2017) has been the third instalment of the conference dedicated to the great Frankfurter scientist, who derived the first black hole solution of Einstein's equations about 100 years ago.

The event has been a 5 day meeting in the field of black holes, AdS/CFT correspondence and gravitational physics. Like the two previous instalments, the conference continued to attract a stellar ensemble of participants from the world's most renowned institutions. The core of the meeting has been a series of invited talks from eminent experts (keynote speakers) as well as the presence of plenary research talks by students and junior speakers.

Specifically the KSM2017 consisted of six kinds of presentations:

- 1 Karl Schwarzschild lecture
- 1 panel discussion
- 1 introductory lecture (30 minutes long)



10 keynotes (60 minutes long)

43 contributed talks (20 minutes long)

14 poster presentations.

Students, junior and senior contributed speakers were selected among participants on the basis of their CV, publication record and abstract of the proposed contribution.

Talks were grouped together by theme as much as possible in five thematic sessions that have been scheduled according to the following scheme:

Holography/Information/Analogue Gravity - I (Monday)

Black hole and Astrophysics - I (Tuesday)

Holography/Information/Analogue Gravity - II (Wednesday)

Black holes theory (Thursday)

Black hole and Astrophysics - II (Friday).

The Karl Schwarzschild Lecture was delivered by Juan Maldacena (IAS) on the topic of the Schwarzschild solution, followed by a lively question period from the audience. A panel consisting of four observationalists and theorists – Martin Ammon (Jena), Avery Broderick (Waterloo/Perimeter), Juan Maldacena (IAS), Erik Verlinde (Amsterdam) – and moderated by Ruth Gregory (Durham) later in the week sought to assess when and where quantum gravity signals might be realizable. Johanna Erdmenger (Würzburg) delivered a lecture about the Gauge/Gravity Correspondence on an introductory level.

The focus on the younger generation of scientists was again a highlight of the meeting, with a new prize category being introduced. The award for overall winner of the Student-Junior joint session went to Mr. Van-Liem Saw (University of Otago), for his presentation “Mass-loss due to gravitational waves with  $\Lambda > 0$ ”. The best student talk award was given to Mr. Michael Wondrak (FIAS, Frankfurt) for his talk “AdS/CFT far from Equilibrium in a Vaidya Setup”. Honorable mentions in this category were awarded to Mr. Nikola I. Gushterov (Oxford), Mr. Alexander Gußmann (LMU Munich), and Mr. Luciano Manfredi (LMU Los Angeles). The Schwarzschild Prize for best junior scientist talk was awarded to Dr. Viancheslav Emelyanov (KIT, Karlsruhe), who spoke on “Local quantum effects in QED induced by evaporating black holes”. The honourable mention in this category was given to Dr. Mario Flory (Jagiellonian University).

The KSM2017 saw the participation of 123 scientists from 24 countries over 6 continents. This included 78 junior and senior scientists, and 45 students.

We present these proceedings as a tribute to the frontier science presented at our meeting, and look forward to future instalments of the KSM.

Frankfurt am Main, December 2017

*Piero Nicolini*  
*Jonas Mureika*  
*Matthias Kaminski*  
*Marcus Bleicher*

## 2. Conference photo and poster



**Figure 1.** Conference photo.

Keynote Speakers:  
Martin Ammon (Jena)  
Raphael Bousso (UC Berkeley)  
Alessandra Buonanno (AEI Potsdam)  
Avery Broderick (Waterloo U. & Perimeter)  
Johanna Erdmenger (Würzburg)  
Heino Falcke (Nijmegen)  
Ruth Gregory (Durham)  
Jutta Kunz (Oldenburg)  
William Unruh (British Columbia)  
Erik Verlinde (Amsterdam)

DFG  
UNIVERSITÄT WÜRZBURG  
HIC FAIR  
FIAS Frankfurt Institute for Advanced Studies

Karl Schwarzschild Lecturer:  
Juan Maldacena (IAS)

**Karl Schwarzschild Meeting 2017**  
Gravity and the Gauge/Gravity Correspondence  
Frankfurt am Main  
24-28 July 2017  
Registration and Program:  
<http://fias.uni-frankfurt.de/ksm2017>

Organizers:  
Piero Nicolini (FIAS)  
Jonas Mureika (LMU - LA)  
Matthias Kaminski (Alabama)  
Marcus Bleicher (FIAS)

Scientific Advisory Committee:  
Claus Lämmerzahl (ZARM & Bremen)  
Robert Mann (Waterloo & Perimeter)  
Martin Reuter (Mainz)  
Dam T. Son (Chicago)  
Herman Verlinde (Princeton)

KSM 2017

Figure 2. Conference poster.

### 3. Sponsors and funding acknowledgments

The organizers of the KSM2017 are grateful for the generosity of the Frankfurt Institute for Advanced Studies for providing the spectacular venue at which the meeting took place. We thank the Deutsche Forschungsgemeinschaft (DFG), the Helmholtz International Center for FAIR, and the Freunde und Förderer der Goethe-Universität Frankfurt for their financial support, as well as the Physikalischer Verein Frankfurt. Special thanks go to Silke Britzen (MPI Bonn), Sven Köppel (FIAS), Iliia Musco (LUTH Paris/Meudon) who served as committee members for the Karl Schwarzschild Prizes for the best presentations in the student and junior scientist categories as well as the overall best student-junior joint session presentation. For their help and support of our efforts, we extend a special acknowledgment to our International Advisory Committee. We are also grateful to Marco Knipfer (FIAS, Frankfurt) for his technical assistance in various phases of the editing of such proceedings. Finally, we are indebted to all participants who helped to make the KSM2017 a success.

### 4. Committees

#### Organizing Committee:

Piero Nicolini (FIAS and Goethe University, Frankfurt)  
Matthias Kaminski (University of Alabama, Tuscaloosa)  
Jonas Mureika (Loyola Marymount University, Los Angeles)  
Marcus Bleicher (FIAS and Goethe University, Frankfurt)

#### International Advisory Committee:

Claus Lämmerzahl (ZARM & University of Bremen)  
Robert Mann (University of Waterloo & Perimeter Institute)  
Martin Reuter (Johannes-Gutenberg University, Mainz)  
Dam T. Son (University of Chicago)  
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