



**International Research Training Group 2150**

**The Neuroscience of Modulating  
Aggression and Impulsivity in Psychopathology**

**1<sup>st</sup> SPRING SCHOOL**



**April 26 – April 29, 2017**

Dear students and colleagues,

Welcome to our new annual Spring School of the International Research Training Group (IRTG): *The Neuroscience of Modulating Aggression and Impulsivity in Psychopathology*. Aggression and impulsivity represent problematic behavior across a variety of neuropsychiatric disorders. Both have extensive socioeconomic consequences. Hence, understanding the mechanistic basis of those problems is of great relevance not only from a clinical but also from a societal perspective. With the research and educational program of the IRTG, we aim to shed light on the neural circuits of impulsivity and aggression, as well as the modulation of these networks in patients by means of advanced neurostimulation techniques. With the planned PhD projects and the expected results, we will **advance and expand existing network models** and will **test innovative therapeutic strategies**. **As an educational program**, the major aim of the IRTG is to support and thereby facilitate and improve doctoral training via a structured and coherent curriculum. The **interdisciplinary nature** of the IRTG and its strong **international orientation** will hopefully give participants an excellent qualification to enter various career paths after leaving the IRTG. Hence, we aim to **optimally prepare young clinical and basic neuroscientists** to tackle these new developments and challenges and further advance our understanding on the **neurobiological bases of pathological aggression and impulsivity**.

The **annual Spring School**, held alternately in Philadelphia or Aachen/Jülich, will initiate and stimulate intense cooperation between PhD students and the American and German supervisors. Here, the **mutual scientific exchange between the partner universities** takes place as well as the thesis committee meetings. German and US students give scientific presentations on their projects and get valuable feedback by their supervisors as a very important part of their scientific training.

The scientific program has been organized by PhD students from all participating institutions and will feature eight sessions, whereby each session covers a topic in the scope of the IRTG. Keynote lectures by experts in different fields of neuroscience will further benefit the program.

Many thanks go to the DFG and the participating institutions: the RWTH Aachen University, Research Center Jülich, and the University of Pennsylvania. Particularly, we would like to thank all speakers for sharing their research and the organizing team for a lot of support.

We are very happy to welcome you here in Philadelphia and are looking forward to exciting and stimulating four days initiating this new IRTG 2150!

Best wishes,



Ruben C. Gur



Ute Habel

**IRTG2150 team**



## Program Overview

### Wednesday, April 26

08.45 am – 09.15 am	Morning coffee
09.15 am – 09.45 am	Welcome and opening: Ute Habel and Ruben Gur
09.45 am – 11.00 am	Session 1: Development and Brain Networks
11.00 am – 11.45 am	Keynote lecture: Danielle Bassett
11.45 am – 12.15 pm	Coffee break
12.15 pm – 1.15 pm	Session 2: Aggression and Antisocial behavior
1.15 pm – 1.30 pm	Photo session
1.30 pm – 2.30 pm	Lunch break
2.30 pm – 4.00 pm	Student thesis committee meetings
4.00 pm – 5.30 pm	Student thesis committee meetings
6.00 pm	Welcome reception and dinner

### Thursday, April 27

09.00 am – 10.15 am	Session 3: Brain Disease Models
10.15 am – 10.45 am	Coffee break
10.45 am – 12.00 pm	Session 4: Brain Stimulation and Feedback
12.00 pm – 12.45 pm	Keynote lecture: Michael L. Platt
12.45 pm – 1.45 pm	Lunch break
1.45 pm – 3.15 pm	Student thesis committee meetings
3.30 pm – 6.00 pm	City tour
6.00 pm	Students' evening

## Program Overview

### Friday, April 28

<b>08.45 am – 09.45 am</b>	<b>Supervisors meeting</b>
<b>09.45 am – 10.45 am</b>	<b>Session 5: Sensory Systems</b>
<b>10.45 am – 11.15 am</b>	<b>Coffee break</b>
<b>11.15 am – 12.30 pm</b>	<b>Session 6: Methods</b>
<b>12.30 pm – 1.30 pm</b>	<b>Session 7: Cells and Genes</b>
<b>1.30 pm – 2.30 pm</b>	<b>Lunch break</b>
<b>2.30 pm – 3.15 pm</b>	<b>Keynote lecture: Kathrin Reetz</b>
<b>3.15 pm – 4.45 pm</b>	<b>Student thesis committee meetings</b>
<b>4.45 pm – 5.45 pm</b>	<b>IRTG board meeting</b>
<b>6.00 pm</b>	<b>Farewell dinner</b>

### Saturday, April 29

<b>09.00 am – 10.15 am</b>	<b>Session 8: Emotion and Cognition</b>
<b>10.15 am – 10.30 am</b>	<b>Coffee break</b>
<b>10.30 am – 11.15 am</b>	<b>Keynote lecture: Marc Spehr</b>
<b>11.15 am – 11.45 am</b>	<b>Synopsis and final remarks</b>

## Wednesday, April 26

08.45 am Morning coffee

09.15 am Welcome and opening: Ute Habel and Ruben Gur

09.45 am Session 1: Development and Brain Networks

Chair:  
*Halim Baqapuri*

**Alexandru Puiu (RWTH)**

Sex and developmental differences in impulsive-aggressive behaviors

**Ursula Tooley (PENN)**

Socioeconomic status and early brain development

**Anne Park (PENN)**

Emotion regulation in adolescence

**Andrew Murphy (PENN)**

Explicitly linking regional activation and function connectivity: Community structure in value learning

**Marleen Werner (RWTH)**

Autonomic nerve system response in aggressive females

11.00 am **Danielle Bassett**  
Emergence of connectome architecture and function in neurodevelopment

Chair:  
*Jeremy Lefort-Besnard*

11.45 am Coffee break

12.15 pm Session 2: Aggression and Antisocial Behavior

Chair:  
*Daniel Alcalá López*

**Kristin Brethel-Haurwitz (PENN)**

Extremes of empathy: Altruism and aggression

**Philipp Honrath (RWTH)**

Aggression in Huntington's disease

**Philippa Hüpen (RWTH)**

Neural correlates of impulsive decision-making

**Ting-Yat Wong (RWTH)**

Association of genetic variants with structural variation in neural networks of aggression

<b>1.15 pm</b>	<b>Photo session</b>
<b>1.30 pm</b>	<b>Lunch break</b>
<b>2.30 pm</b>	<b>Student thesis committee meetings</b>
<b>4.00 pm</b>	<b>Student thesis committee meetings</b>
<b>6.00 pm</b>	<b>Welcome reception and dinner</b>



## Thursday, April 27

### 09.00 am Session 3: Brain Disease Models

Chair:  
*Philipp Honrath*

**Simon Koppers (RWTH)**

Modeling and reconstruction of diffusion anisotropies using deep learning

**Lisa Yankowitz (PENN)**

Brain morphology in autism spectrum disorder

**Cedric Xia (PENN)**

Network dysconnectivity associated with psychopathology across clinical diagnostic categories

**Linda Yu (PENN)**

Ventromedial prefrontal damage affects preference stability, not transitivity

**Jeremy Lefort-Besnard (RWTH)**

Different shades of the default mode dysfunction in schizophrenia: Subregional covariance estimation in structure and function

### 10.15 am Coffee break

### 10.45 am Session 4: Brain Stimulation and Feedback

Chair:  
*Leonie Löffler*

**Lena Hofhansel (RWTH)**

Effects of neurostimulation on emotion regulation and aggression in violent offenders

**Carmen Weidler (RWTH)**

Modulation of aggression by prefrontal transcranial direct current stimulation (tDCS)

**Micha Keller (RWTH)**

Physiological self-regulation: The brain-heart axis

**Marcel Leclerc (RWTH)**

Neurostimulation as a tool to study source-monitoring in the human brain

**Olivia Choy (PENN)**

Transcranial direct current stimulation of the prefrontal cortex modulates violent criminal intent: A randomized controlled trial



**12.00 pm**

**Michael L. Platt**  
Neurobiology of strategic social behavior

**Chair:**  
***Julia Mohrhardt***

**12.45 pm**

**Lunch break**

**1.45 pm**

**Student thesis committee meetings**

**3.30 pm**

**City tour**

**6.00 pm**

**Students' evening**

## Friday, April 28

**08.45 am** Supervisors meeting (German and American Supervisors)

**09.45 am** Session 5: Sensory systems

**Chair:**  
*Simon Koppers*

**Clara von Marschall (RWTH)**

Neural correlates of emotional prosody production

**Jana Zweerings (RWTH)**

Aberrant auditory change detection in depression: an fMRI investigation

**Denise Y. Harvey (PENN)**

Frontally-mediated cognitive control and its interaction with the language system

**Laura Bell (RWTH)**

AActING on hearing loss - Attentional ACTivation Implementing Near-infrared-spectroscopy Groundwork

**10.45 am** Coffee break

**11.15 am** Session 6: Methods

**Chair:**  
*Lena Hofhansel*

**Halim Baqapuri (RWTH)**

Development of gaming infrastructure to aid in self-regulation of fronto-limbic connectivity and its effects on aggressive behaviors

**Tyler Moore (PENN)**

Development of a computerized adaptive (CAT) version of the schizotypal personality questionnaire

**Daniel Alcalá López (RWTH)**

Computing the social brain across systems and states

**Teresa Karrer (RWTH)**

Automated screening of impaired cognitive domains in schizophrenia

**Stathis Gennatas (PENN)**

Biomedical data analysis with rtemis

**12.30 pm    Session 7: Cells and Genes**

**Chair:**  
*Sanne Tops*

**Julia Mohrhardt (RWTH)**

Mitral cell oscillations in the accessory olfactory bulb

**Maximilian Nagel (RWTH)**

A calcium signaling 'finger print' in vomeronasal sensory neurons

**Ramya Rama (RWTH)**

Serotonergic modulation in layer 5 of the rat prefrontal cortex

**Kate Brynildsen (PENN)**

Interactions of genetic variants on opioid and nicotine dependence

**1.30 pm    Lunch break**

**2.30 pm**

**Kathrin Reetz**

Multimodal imaging in rare neurodegenerative diseases

**Chair:**

*Stathis Gennatas*

**3.15 pm    Student thesis committee meetings**

**4.45 pm**

**IRTG board meeting**

**6.00 pm**

**Farewell dinner**

## Saturday, April 29

**09.00 am    Session 8: Emotion and Cognition**

**Chair:**  
*Ting-Yat Wong*

**Leonie Löffler (RWTH)**

Emotion regulation in depression – an fMRI study

**Friederike Henzelmann (RWTH)**

The influence of vasopressin and testosterone on risky behavior

**Sanne Tops (RWTH)**

The Verbal Interaction Stress Task: a new paradigm implementing verbal, interactive and social components for investigating the effects of social rejection on psychosocial stress

**Ankit Khambhati (PENN)**

Functional subgraphs of brain networks modulate cognitive control processes between task states

**Susanne Stickel (RWTH)**

Neural correlates of emotional interference in mothers with postpartum depressivity

**10.15 am    Coffee break**

**10.30 am    Marc Spehr**  
Probing the role of the accessory olfactory system in mouse aggressive behavior

**Chair:**  
*Philippa Hüpen*

**11.15 am    Synopsis and final remarks**

# Student thesis committee meetings

**Wednesday, April 26**

Student	Supervisor RWTH	Supervisor PENN	Third Member
<b>2.30 pm – 3.15 pm</b>			
Halim Baqapuri	Klaus Mathiak	Ruben Gur	Han-Gue Jo
Cedric Xia	Dorit Merhof	Ted Satterthwaite	Sina Radke
Carmen Weidler	Ute Habel	Julie Blendy	Benjamin Clemens
Ramya Rama	Dirk Feldmeyer	Ted Abel	Mikhail Votinov
<b>3.15 pm – 4.00 pm</b>			
Philipp Honrath	Kathrin Reetz	Raquel Gur	Olga Wudarczyk
Philippa Hüpen	Frank Schneider	Joe Kable	Lisa Wagels
Sanne Tops	Ute Habel	Ted Abel	Sina Radke
Stathis Gennatas	Danilo Bzdok	Ruben Gur	Mikhail Votinov
Marleen Werner	Kerstin Konrad	Adrian Raine	Barbara Schulte Holthausen
<b>4.00 pm – 4.45 pm</b>			
Alexandru Puiu	Kerstin Konrad	Bruce Turetsky	Olga Wudarczyk
Teresa Karrer	Danilo Bzdok	Danielle Bassett	Han-Gue Jo
Ting-Yat Wong	Thomas Nickl-Jockschat	Ruben Gur	Mikhail Votinov
Olivia Choy	Ute Habel	Adrian Raine	Benjamin Clemens
<b>4.45 pm – 5.30 pm</b>			
Simon Koppers	Dorit Merhof	J. Christopher Edgar	Barbara Schulte Holthausen
Susanne Stickel	Ute Habel	Sara Jaffee	Lisa Wagels
Laura Bell	Kerstin Konrad	Raquel Gur	Sina Radke
Kate Brynildsen	Marc Spehr	Julie Blendy	Mikhail Votinov

## Student thesis committee meetings

**Thursday, April 27**

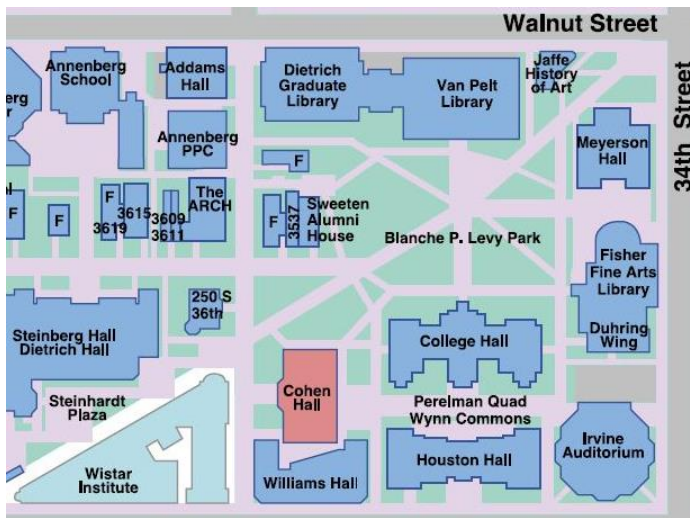
Student	Supervisor RWTH	Supervisor PENN	Third Member
1.45 pm – 2.30 pm			
Daniel Alcalá López	Danilo Bzdok	Bruce Turetsky	Han-Gue Jo
Micha Keller	Klaus Mathiak	J. Christopher Edgar	Barbara Schulte Holthausen
Lena Hofhansel	Ute Habel	Adrian Raine	Benjamin Clemens
Linda Yu	Kathrin Reetz	Joe Kable	Lisa Wagels
2.30 pm – 3.15 pm			
Max Nagel	Marc Spehr	Julie Bendy	Mikhail Votinov
Leonie Löffler	Ute Habel	Ted Satterthwaite	Sina Radke
Clara von Marschall	Klaus Mathiak	Ruben Gur	Barbara Schulte Holthausen
Lisa Yankowitz	Frank Schneider	J. Christopher Edgar	Olga Wudarczyk

**Friday, April 28**

Student	Supervisor RWTH	Supervisor PENN	Third Member
3.15 pm – 4.00 pm			
Marcel Leclerc	Ute Habel	Roy Hamilton	Benjamin Clemens
Jana Zweerings	Klaus Mathiak	Bruce Turetsky	Olga Wudarczyk
Jeremy Lefort-Besnard	Danilo Bzdok	Danielle Bassett	Han-Gue Jo
Anne Park	Kerstin Konrad	J. Christopher Edgar	Barbara Schulte Holthausen
4.00 pm – 4.45 pm			
Julia Mohrhardt	Marc Spehr	Joe Kable	Mikhail Votinov
Friederike Henzelmann	Ute Habel	Ruben Gur	Lisa Wagels
Ursula Tooley	Kerstin Konrad	J. Christopher Edgar	Olga Wudarczyk
Andrew Murphy	Klaus Mathiak	Danielle Bassett	Han-Gue Jo

## Locations

All sessions will take place in Claudia Cohen Hall (formerly Logan Hall)



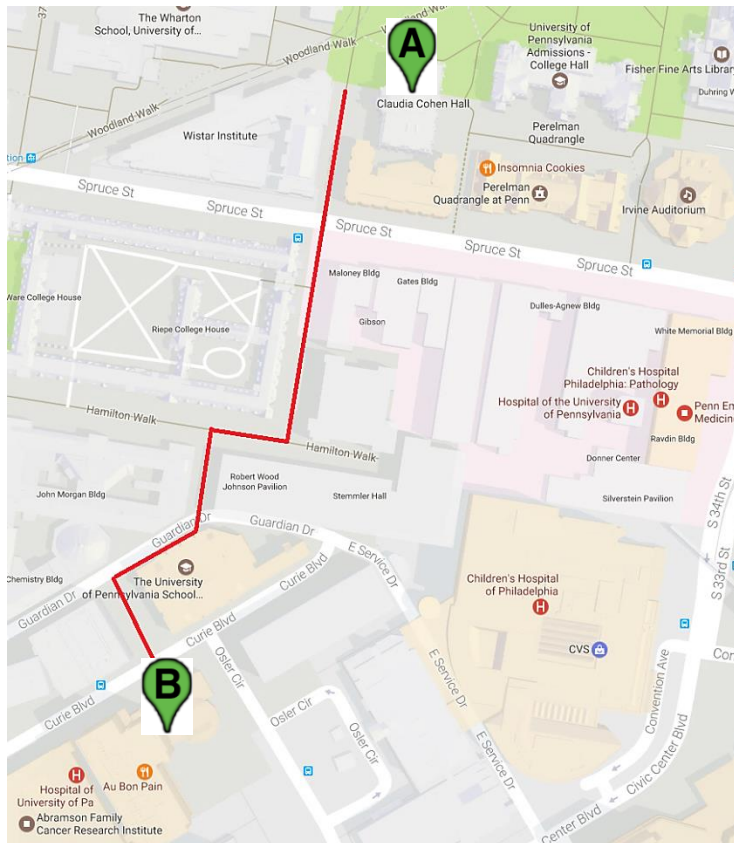
## Welcome reception: Biomedical Research Building



**Claudia Cohen (Logan) Hall**  
Glass of '55 Terrace Room  
Ground Floor Level – Room G14  
249 South 36<sup>th</sup> Street  
Philadelphia, PA 19104



**Biomedical Research Building (BRB)**  
4<sup>th</sup> Floor Faculty Lounge  
421 Curie Boulevard  
Philadelphia, PA 19104





## Locations

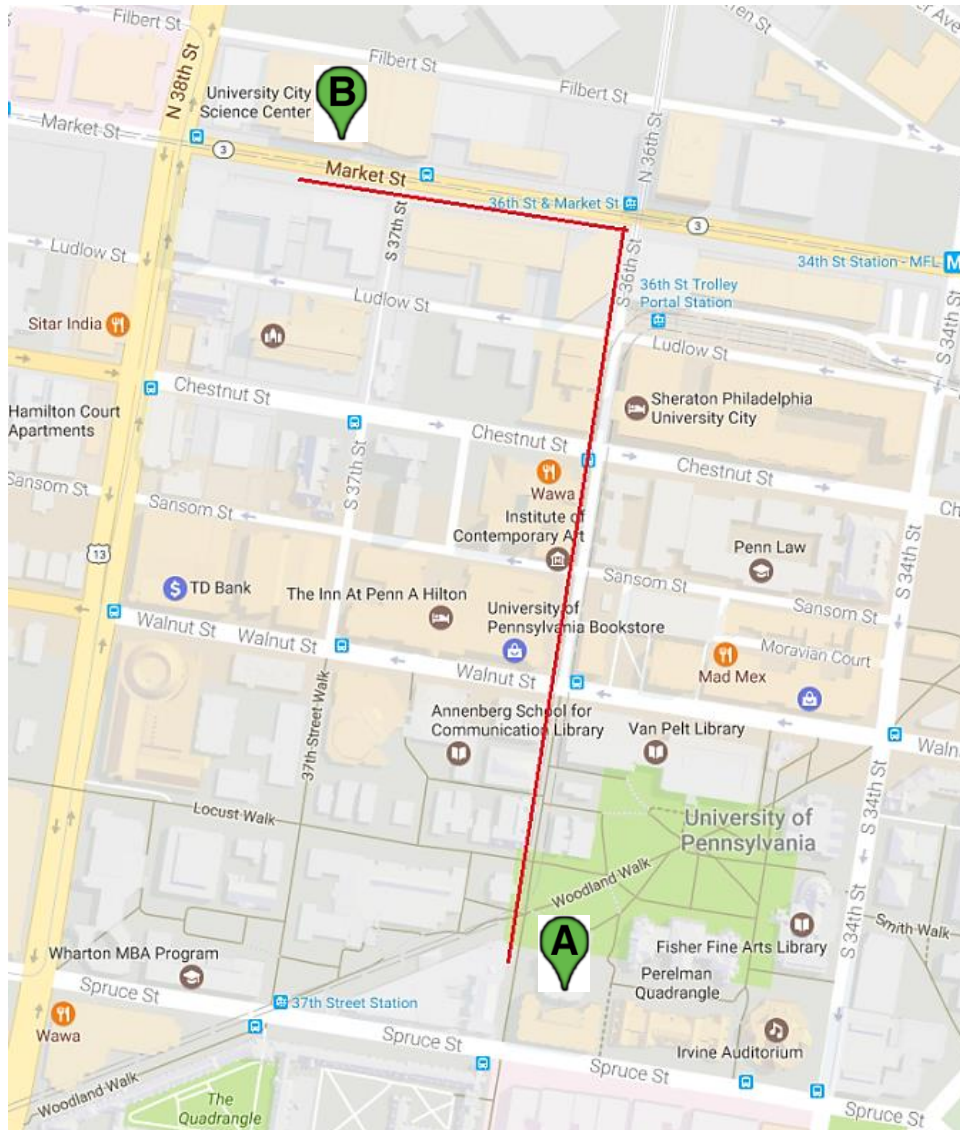
### Farewell dinner: Han Dynasty University City



**University of Pennsylvania**  
Claudia Cohen (Logan) Hall,  
249 South 36<sup>th</sup> Street  
Philadelphia, PA 19104



**Han Dynasty University City**  
3711 Market Street  
Philadelphia, PA, 19104  
Phone: (215) 222-3711



## Locations



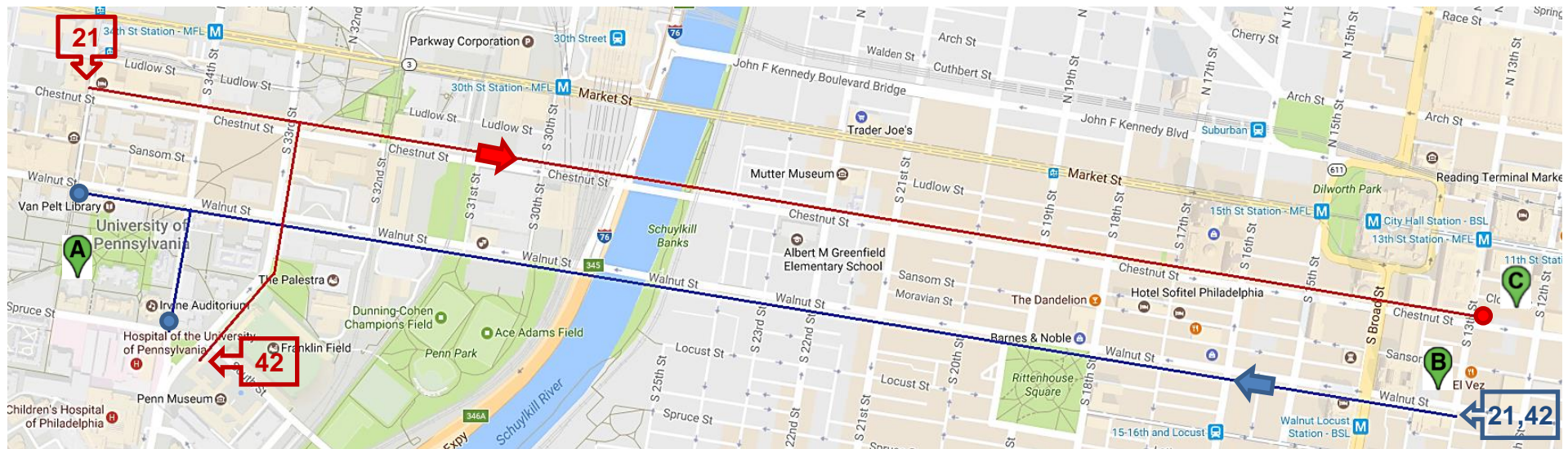
**University of Pennsylvania**  
Claudia Cohen (Logan) Hall,  
249 South 36<sup>th</sup> Street  
Philadelphia, PA 19104



**Holiday Inn Express Midtown**  
1305 Walnut Street  
Philadelphia, PA 19107  
Phone: (215) 735-9300



**Stay Alfred**  
1201 Chestnut Street,  
Philadelphia, PA 19107  
Phone: (844) 696-5603



- Bus lines to UPENN go from stop (corner of Walnut St & 13<sup>th</sup> St) along Walnut Street: **21** (exit at Walnut St & 36<sup>th</sup> St) OR **42** (exit at 34<sup>th</sup> St & Spruce St).
- Bus lines to HOTEL go along Chestnut St to stop Chestnut St & 13<sup>th</sup> St: **21** (from stop Chestnut St & 36<sup>th</sup> St) OR **42** (from stop 33<sup>rd</sup> St & Spruce St).

## Info

### AirPennNet - Guest Conference Code Instructions

- 1) Please select the “**AirPennNet - Guest**” option under your available wireless connections.
- 2) You will then be prompted to open your web browser. Once you do you will be directed to the page. Please select the “**Guest Conference Code Registration**”.
- 3) Once you click on that link you will be taken to a “Guest Conference Code Registration Form”. Please fill it out accordingly. The verification link for your temporary AirPennNet - Guest access will be sent to the email that you list. Please enter the provided conference code “**C-JHZNHJQN** “. Click on “CONTINUE” when you are done.
- 4) Please reboot your device and use the 15-minute internet access to sign on to your email. The link you need to click on will appear in your email.
- 5) After clicking on the provided link you will be directed to a confirmation page. You will then have wireless access via “AirPennNet - Guest”.

IRTG2150



Spring School evaluation



## IRTG Speakers

Prof. Ruben C. Gur, Ph.D., Department of Psychiatry, School of Medicine, University of Pennsylvania, 10 Gates Pavilion, 3400 Spruce Street, Philadelphia, USA, [gur@mail.med.upenn.edu](mailto:gur@mail.med.upenn.edu)

Prof. Dr. Ute Habel, Department of Psychiatry, Psychotherapy and Psychosomatics, Medical Faculty, RWTH Aachen, Pauwelsstr. 30, 52074 Aachen, Germany, [uhabel@ukaachen.de](mailto:uhabel@ukaachen.de)



[www.irtg2150.rwth-aachen.de](http://www.irtg2150.rwth-aachen.de)



[www.jara.org/de/research/jara-brain/](http://www.jara.org/de/research/jara-brain/)

Cover: <http://www.craigandkarl.com>

