Welcome to

JOHANNES GUTENBERG UNIVERSITÄT MAINZ

Mainz Institute for Theoretical Physics

MITP Program "Dark Matter Identification: Connecting Theory and Signature Space"

April 1 – 12, 2019

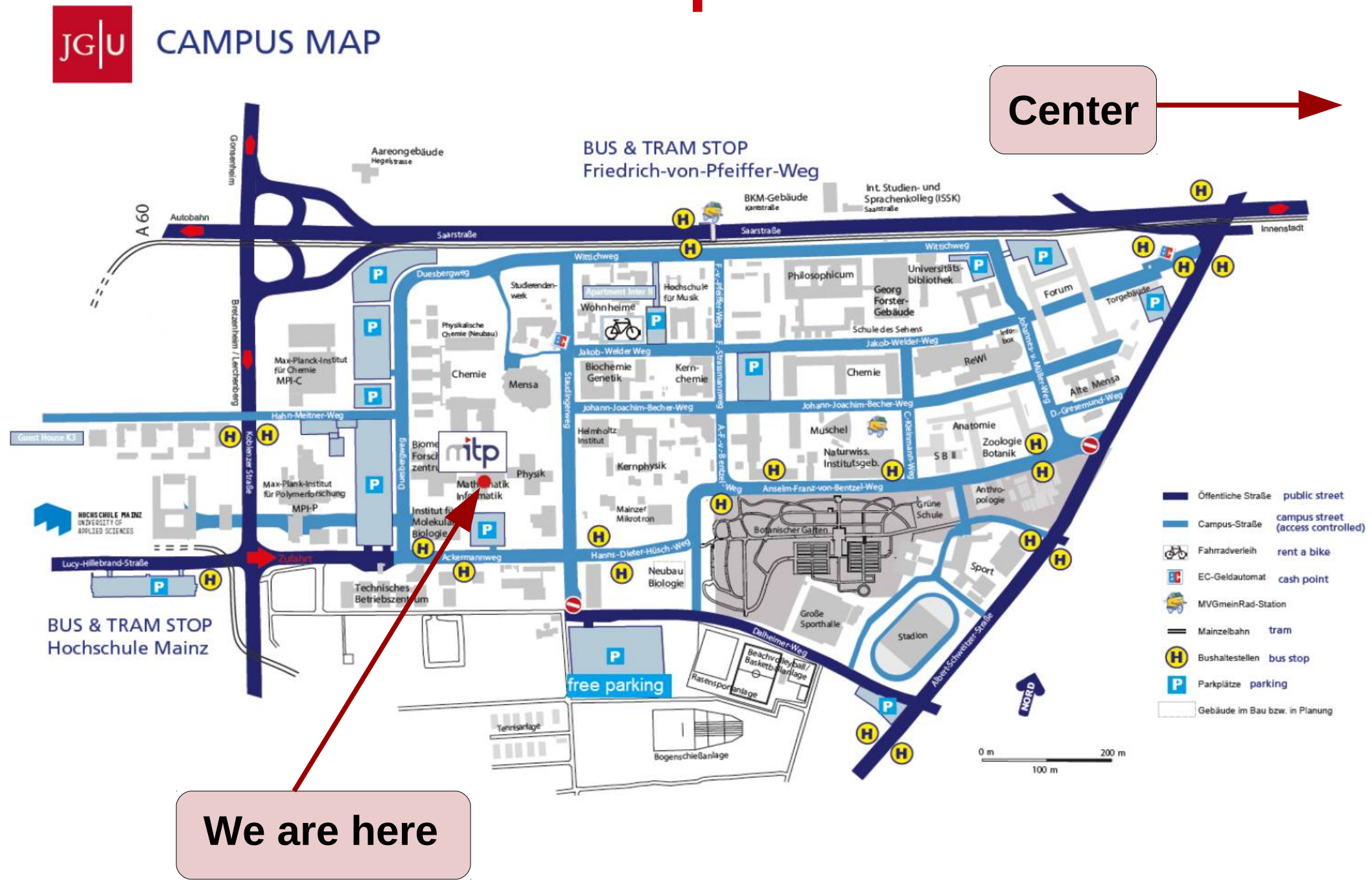
University Campus, Mainz

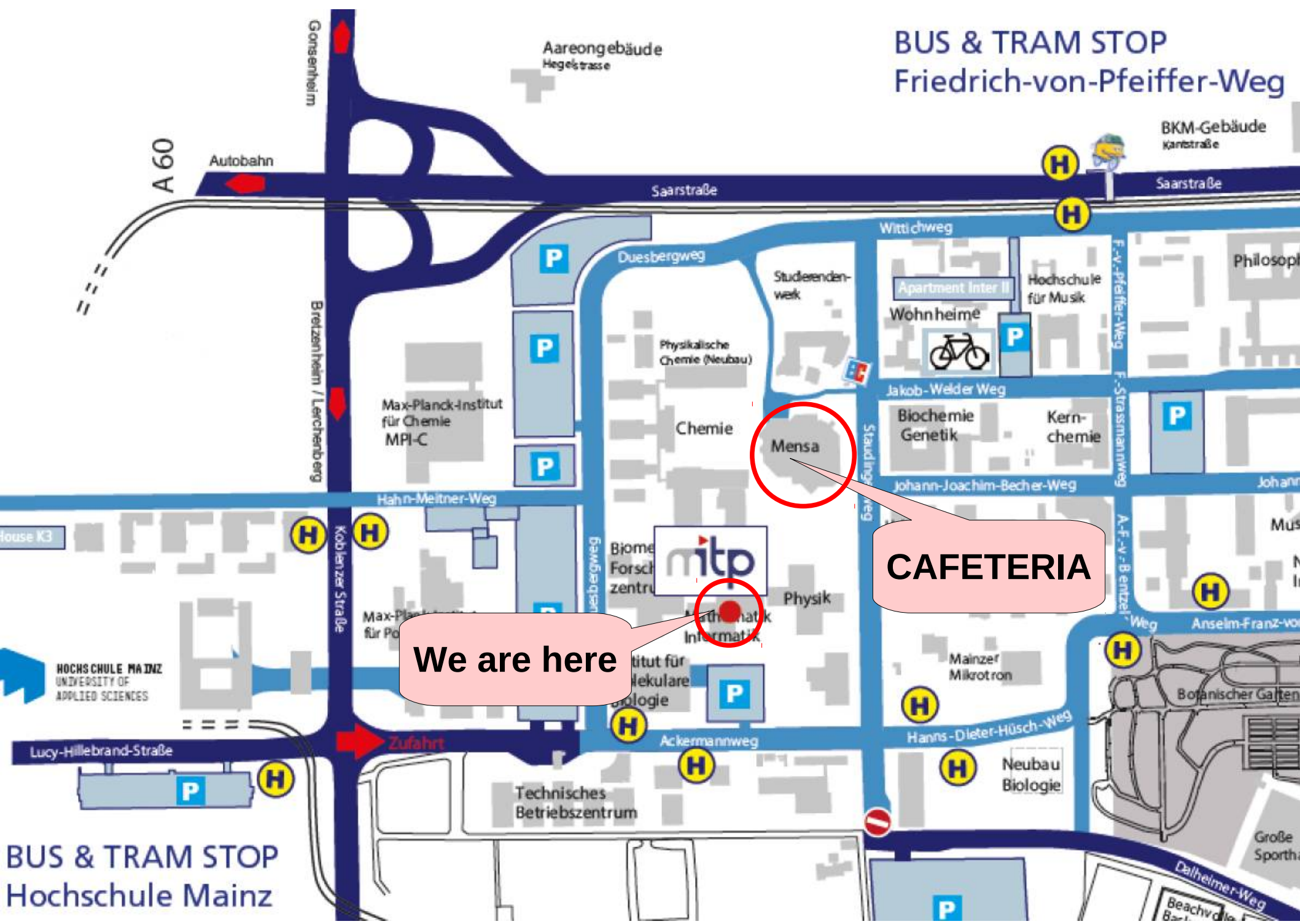
https://indico.mitp.uni-mainz.de/e/dmi2019

DMI 2019 workshop

- **Organisers:**
  Genevieve Belanger (LAPTH, Annecy, Farnce
  Alexander(Sasha) Belyaev (Southampton U, UK)
  Tilman Plehn (U Heidelberg, Germany)
- **The idea**
  is to bring together experts from various DM communities: model builders, astroparticle physicists, collider phenomenologists, experimentalists and developers of DM tools and to catalyse collaboration in the atmosphere of the **real workshop.**
- **The main problems we pan to discuss**
  - classification of DM models
  - classification of signatures at colliders, direct and indirect DM searches
  - exploring potential of new signatures
  - establishing connection between theory and signature space
  - exploring further complementarity between collider and non-collider searches
  - **many more problems, suggested by you!**

Practical points

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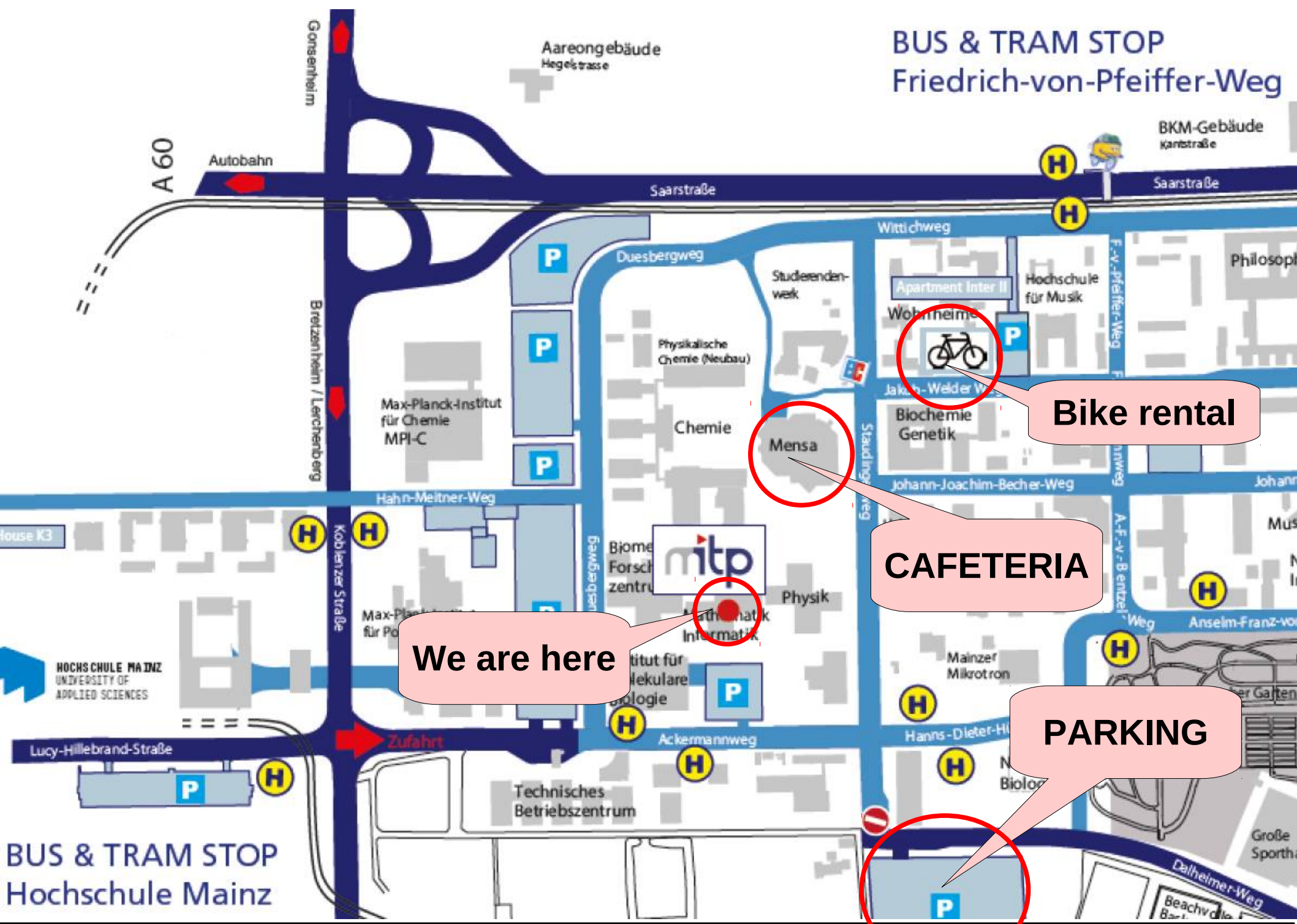
Hegelstrasse
BKM-Gebäude
Autobahn
A 60
Saarstraße
Wittichweg
Duesbergweg
Studierenden-werk
Apartment Inter II
Wohnheime
Hochschule für Musik
Philosoph
Physikalische Chemie (Neubau)
Max-Planck-Institut für Chemie MPI-C
Chemie
Mensa
Jakob-Welder Weg
Biochemie Genetik
Kern-chemie
Johann-Joachim-Becher-Weg
Hahn-Meitner-Weg
Koblenzer Straße
Physik
Mainzer Mikrotron
Botanischer Garten
Ackermannweg
Hanns-Dieter-Hüsch-Weg
Neubau Biologie
Technisches Betriebszentrum
Lucy-Hillebrand-Straße
Zufahrt
HOCHSCHULE MAINZ
UNIVERSITY OF APPLIED SCIENCES
Dalheimer-Weg
BUS & TRAM STOP
Hochschule Mainz
CAFETERIA
We are here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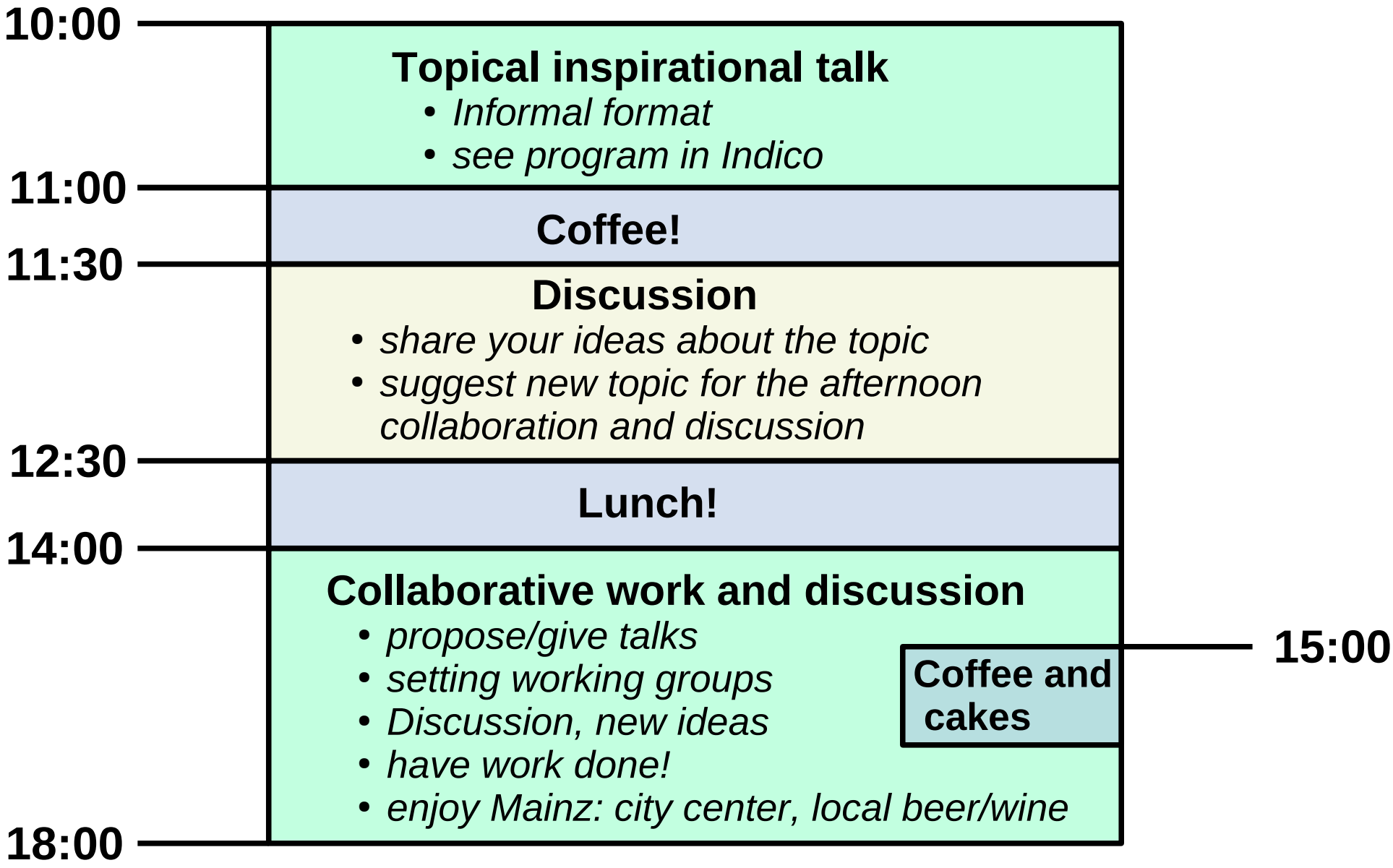
Große Sportha
Dalheimer-Weg
BUS & TRAM STOP
Hochschule Mainz
Bike rental
CAFETERIA
We are here
PARKING

Explore city center in the evenings and weekends!

Practical points

- **No social events pre-organised: it's in our hands during the 2 weeks**
- **Lunch: one of the best options to go together to the MENSA (upstairs cash payments allowed)**
- **Coffee break at 15h00 with pastries**
- **Weekly bus tickets: at the Main train station!**
- **Ask Heike (or e-mail to dmi2019@uni-mainz.de) in case of questions**

Our schedule



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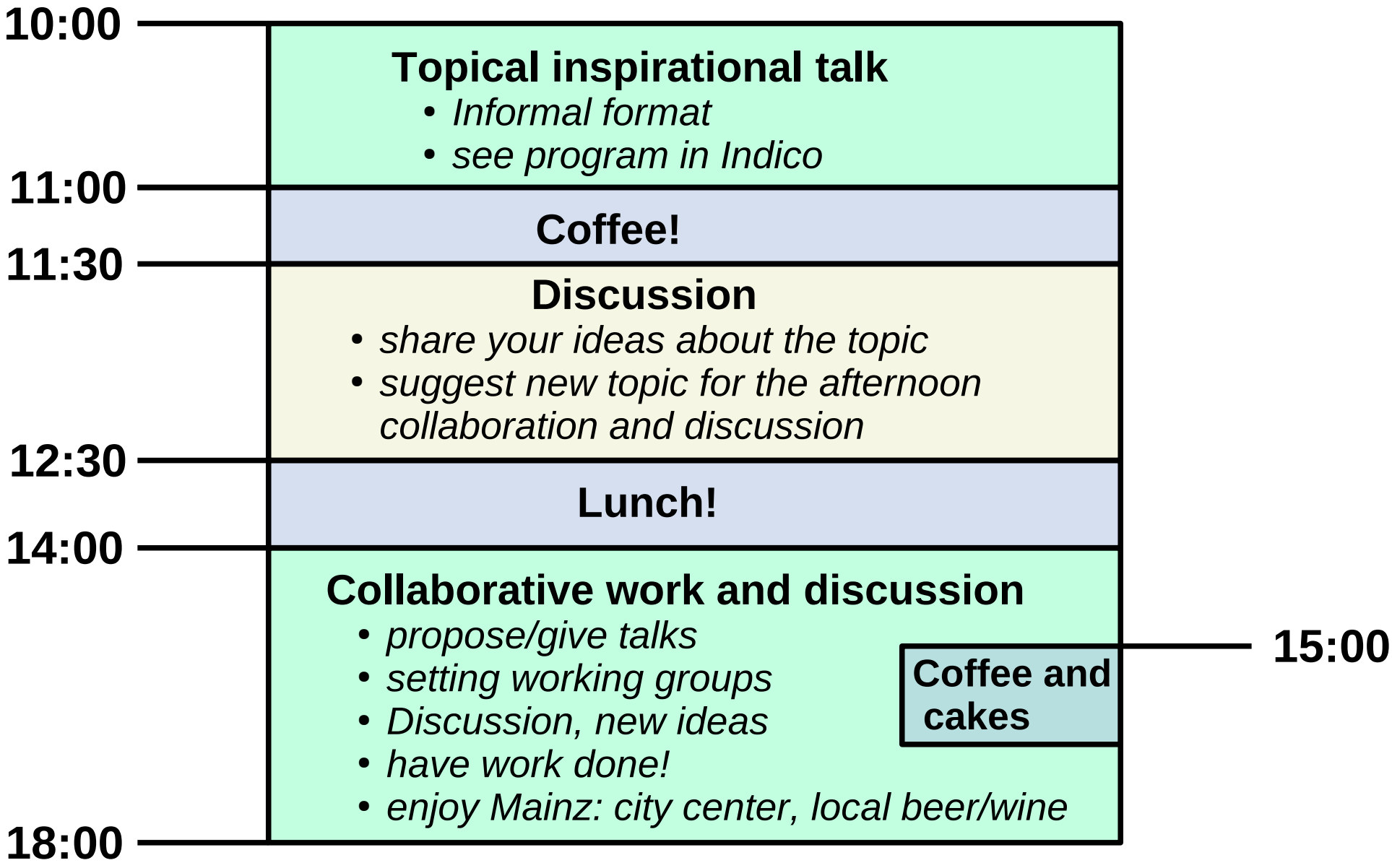


The program will be continuously updated!
Ask Sasha to add new topics! (or write to a.belyaev@soton.ac.uk)

The list of Participants

Title	First Name	Last Name	Institute	Week 1	Week 2
Dr.	Georgios	Anagnostou	NCSR DEMOKRITOS	X	
Prof.	Martin	Bauer	Durham University	X	X
Prof.	Genevieve	Belanger	LAPTh Annecy	X	X
Prof.	Alexander	Belyaev	University of Southampton	X	X
Dr.	Anja	Butter	Universtität Heidelberg	X	X
Dr.	Giacomo	Cacciapaglia	CNRS/Univ. of Lyon	X	X
Dr.	Jonathan	Cornell	University of Cincinnati	X	X
Prof.	Laura	Covi	Universität Göttingen	X	X
Dr.	Bastian	Diaz	Federico Santa Maria Technical University	X	X
Dr.	Michael	Duerr	University of Oxford	X	X
Prof.	Rouven	Essig	Stony Brook University		X
Dr.	Andreas	Goudelis	Laboratoire de Physique Theorique et Hautes Energies	X	X
Dr.	Jan	Heisig	Université catholique de Louvain		X
Prof.	Pyungwon	Ko	Korea Institute for Advanced Study (KIAS)	X	
Dr.	K.C.	Kong	University of Kansas	X	X
Dr.	Sabine	Kraml	LPSC Grenoble		X
Prof.	Frank	Krauss	Durham University		X
Dr.	Daniel	Locke	University of Southampton	X	X
Prof.	Tilman	Plehn	Universität Heidelberg	X	X
Dr.	Alexander	Pukhov	Lomonosov Moscow State University	X	X
Dr.	Maria	Ramos	University of Porto		X
Dr.	Tirtha Sankar	Ray	Indian Institute of Technology Kharagpur		X
Dr.	Peter	Reimitz	Universität Heidelberg	X	
Dr.	Tania	Robens	Institute Ruder Boskovic	X	
Dr.	Felipe	Rojas Abatte	University of Southampton	X	X
Dr.	Rachel	Rosten	Universitat Autònoma de Barcelona	X	X
Dr.	Pat	Scott	Imperial College London		X
Dr.	Seodong	Shin	University of Chicago / Yonsei University	X	
Dr.	Patrick	Stengel	Stockholm University & Oskar Klein Centre		X
Dr.	Gaurav Kumar	Tomar	Sogang University		X
Dr.	Martin	Winkler	Stockholm University		X
Dr.	José Francisco	Zurita	KIT Karlsruhe	X	X

See Indico page who and when is around you!

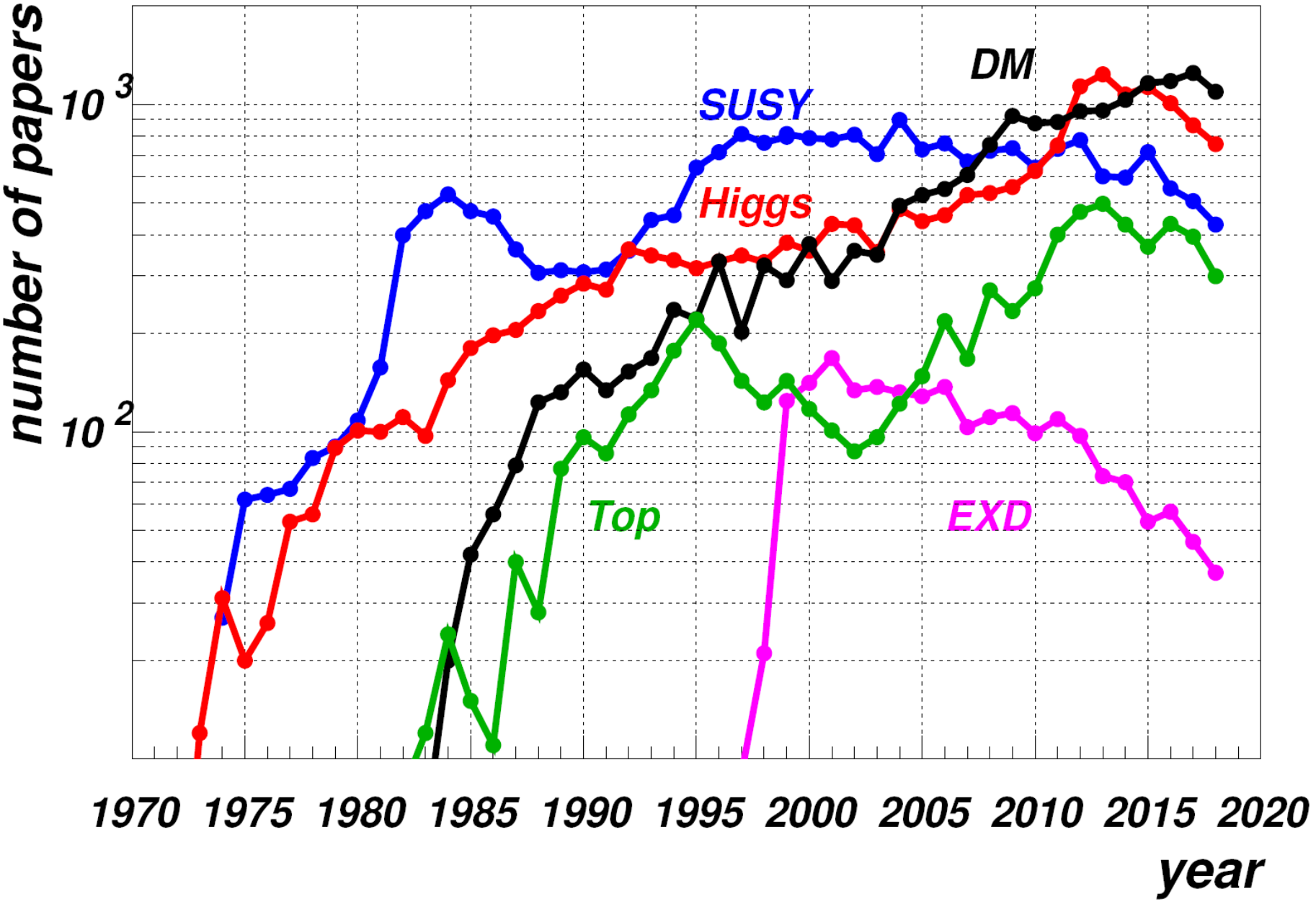
Week 1

	Speaker	Topic
Mon	Giacomo Cacciapaglia	Dark Matter Theory (WIMP models)
Tue	Rachel Rosten	DM searches at the LHC - challenges and innovations
Wed	Martin Bauer	Dark Matter Phenomenology
Thu	Laura Covi	Dark Matter Theory (beyond WIMPs)
Fri	Mark Vogelsberger	Simulating Structure Formation beyond CDM

Week 2

	Speaker	Topic
Mon	Pat Scott	DM Tools
Tue	Rouven Essig	Direct Detection of sub-GeV Dark Matter
Wed	Martin WInkler	Indirect DM detection
Thu	Sabine Kraml	DM (re)interpretation of LHC searches
Fri	TBD	Summaries

Dark Matter is in the main focus after Higgs discovery
(statistics of publications based on inSPIRE database)



Dark Matter topics

- What do we know about DM?
- What we could learn about DM in 5, 10, 15 (end of LHC HL) years?
- What theories of DM are least explored?
- What signatures of DM are least explored?
- What is the potential of “table-top” experiments , QS technologies in probing light DM
- Which gaps in theory/signature space and in DM mass range we should explore?
- Is there any potential of future experiments (including 100 TeV FCC) to completely cover thermal DM?
- Shall we go beyond minimal consistent models and in which direction?
- What DM tools we need to develop further?
- In case of DM signal at collider and non-collider experiments in the future what would be the strategy to decode underlying theory?
- …… your questions go here

Foreseen outcome of DMI workshop

- You are inspired!
- New collaborations
- New problems raised
- New ideas generated
- Proceedings/white paper addressing some of the questions/problems listed

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Please acknowledge MITP!