

Workshop on Reconstruction and Machine Learning in Neutrino Experiments

in Hamburg

Björn Wonsak



Universität Hamburg

DER FORSCHUNG | DER LEHRE | DER BILDUNG



Deutsche
Forschungsgemeinschaft

German Research Foundation



Welcome

- **Some had a very long trip!**
- **I'm very happy to have you all here!**

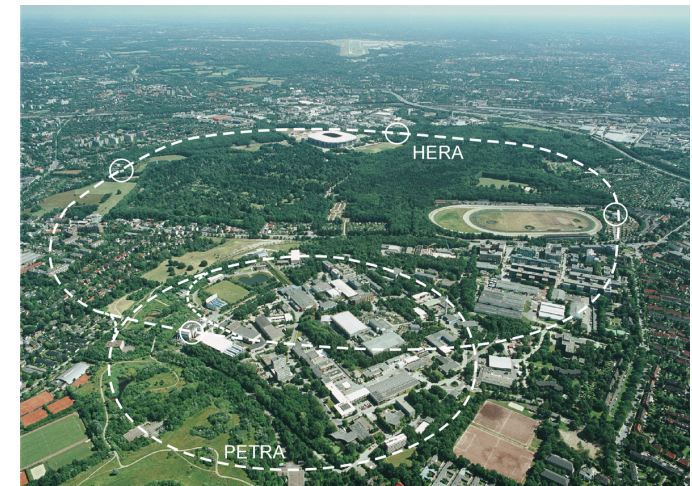
+ Valparaíso, Chile



General Information

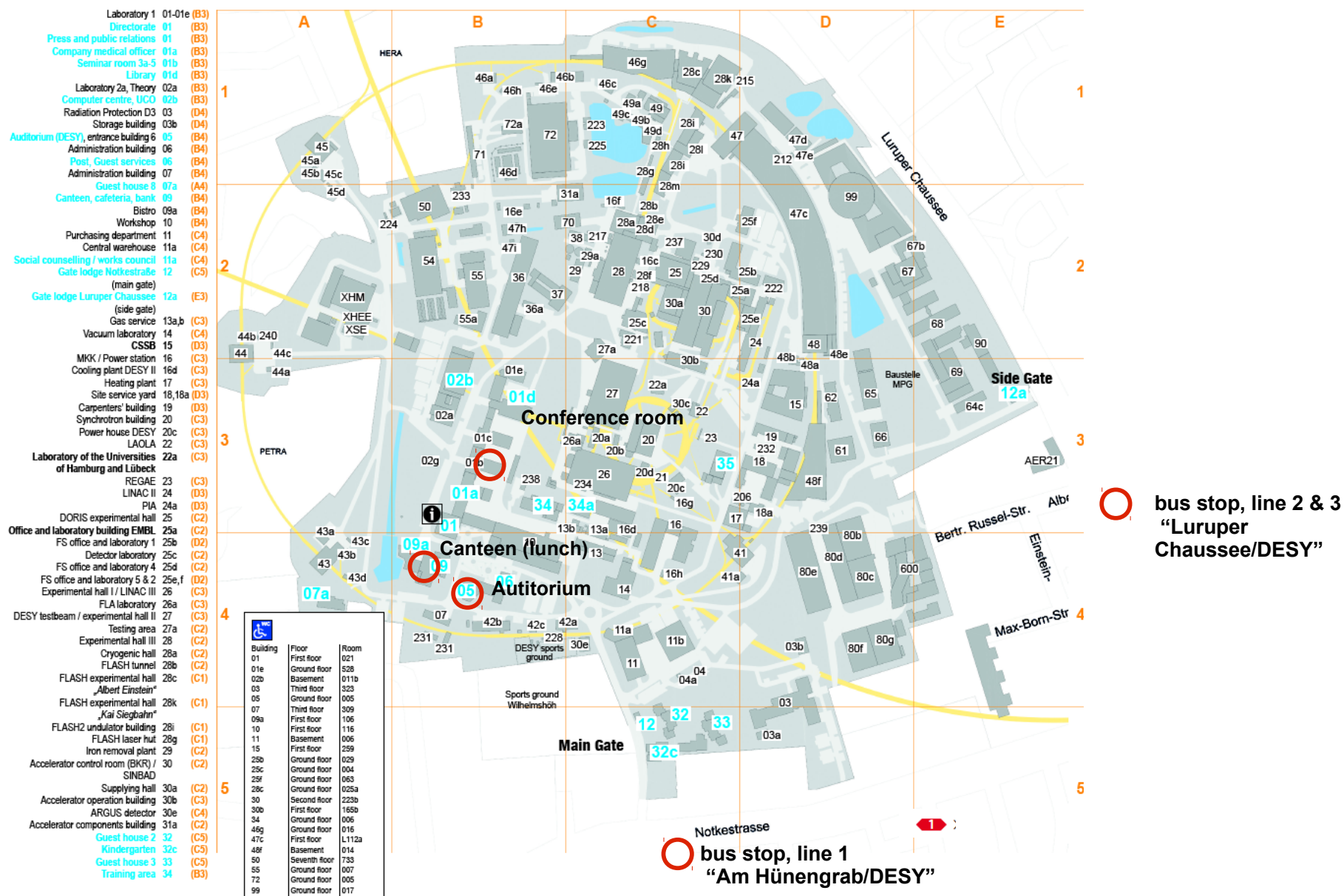
- **DESY:**

- Used to be center of particle physics
 - Still strong involvement in this area
- Now mainly a center for brilliant light sources
- Also large interest in dark matter searches
- Also strong in astro-particle physics at DESY-Zeuthen



Guided tour: Will give you the full overview on this!
Starts with a talk in this seminar room at 16:00.

DESY Sites of Interest

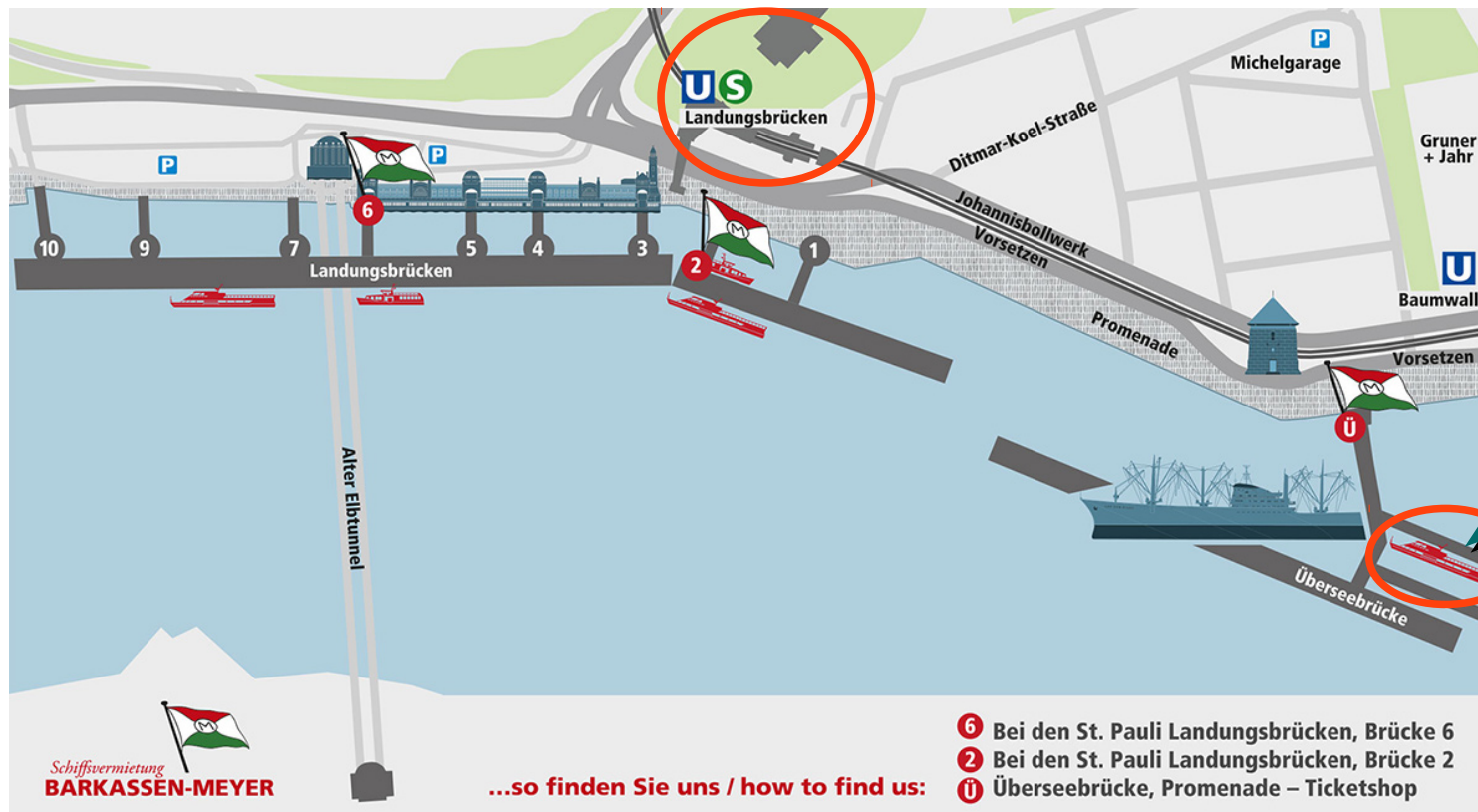


Our Diner on Tuesday

- Harbor-cruise
- Ship: MS “Hafen Hamburg” or MS “Hamburger Deern”



Metro-station “Landungsbrücken”



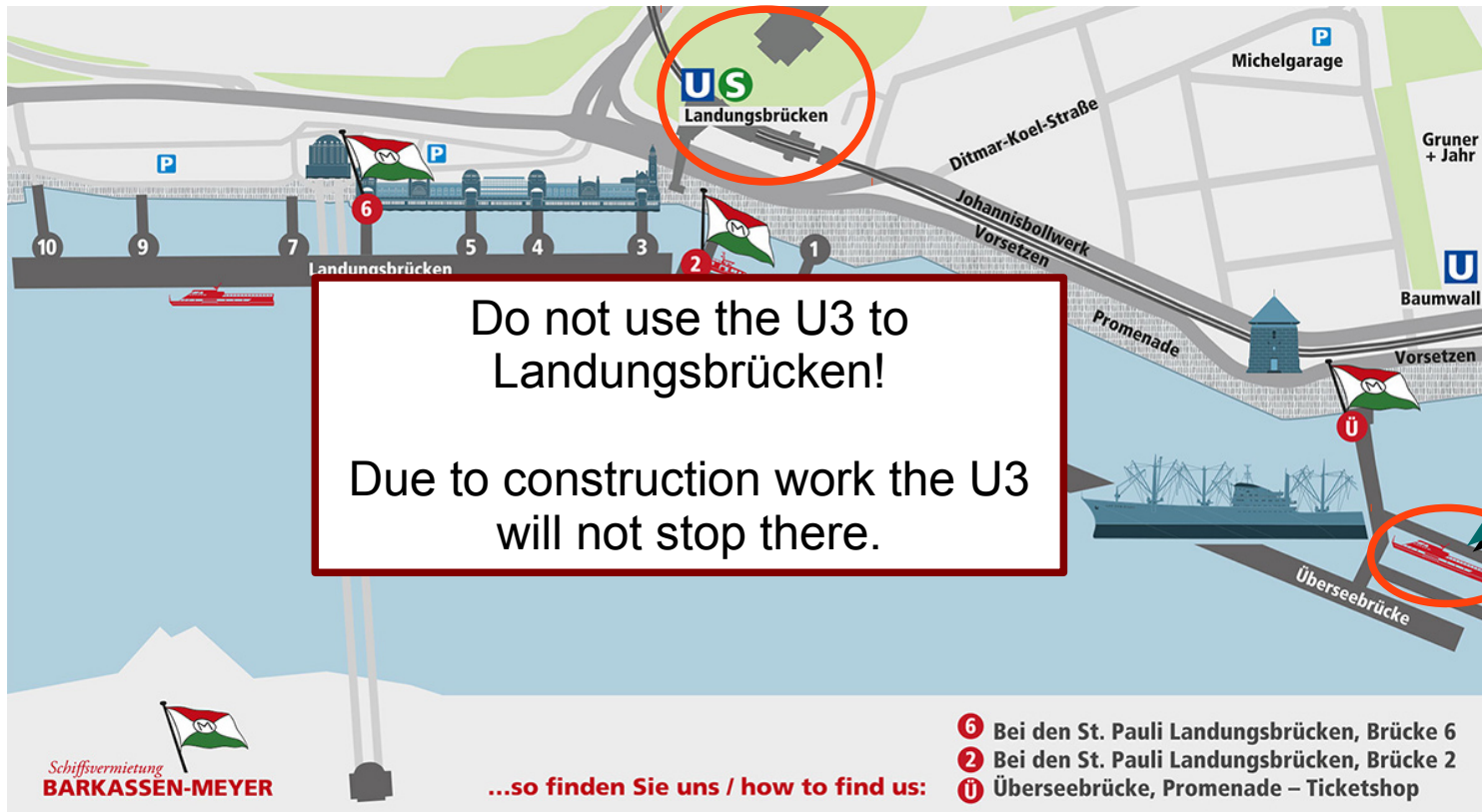
Boarding site

Our Diner on Tuesday

- **Harbor-cruise**
- **Ship:** MS “Hafen Hamburg” or MS “Hamburger Deern”



Metro-station “Landungsbrücken”



Boarding site

Our Diner on Tuesday

- **Boarding 19:45 (7:45 PM)**
- **Cast off: 20:00 (8:00 PM)**



How to go there

- To get Information about public transportation use:
<https://www.hvv.de/en>



Timetables



Tickets



Service




















About us





MeinHVV



Contact

Times	Journey plan	Duration	Change of lines	Price	
18:22 - 18:47	 > 	0:25 h	1	€3.30	▼
18:32 - 18:57	 > 	0:25 h	1	€3.30	▼
18:42 - 19:07	 > 	0:25 h	1	€3.30	▼
18:52 - 19:17	 > 	0:25 h	1	€3.30	▼
19:02 - 19:27	 > 	0:25 h	1	€3.30	▲
19:02	 Zum Hünengrab (DESY) ▼				
	 Bus 1 → Bf. Altona ▼				
19:11	 S Othmarschen ▼				
	 Way on foot when changing 2 mins. ▼				
19:14	 Othmarschen ▼				
	 S1 → Poppenbüttel / Hamburg Airport (Flughafen) ▼				
19:27	 Landungsbrücken (Gleis 2 (S-Bahn)) ▼				

 Timetable overview

 Show on map

Price Single Ticket €3.30

Alternatives to a Single Ticket [Overview of fares](#)

Internet Access

- **Three possibilities:**

- Eduroam
- Conference Net:
 - DESY-Guest-Test
(no password)
- DESY Guest Net

https://it.desy.de/services/networks/guest_net/index_eng.html

Guest net

General Information

For guests and visitors DESY operates a guest network which can be used by Ethernet (LAN) or wireless (WIFI) after email registration.

Basically, with this network it is possible to access the internet with network-compatible devices. The guest network can be used if you connect your device to the left plug of a network socket or by using the unencrypted WIFI network 'DESY-Guest'.

Registration and Log in Procedure

> If a device is connected to the guest network (via WIFI or LAN) an IP address will be requested - usually automatically - via DHCP. After that you must register by email. It is possible to use all internet browsers to call up any **unencrypted webpage** (<http://...> **NOT** <https://...>). You will then be forwarded automatically to the web portal of the guest network.

Note: The 'desy.de' website can generally also be reached from non-registered guests and devices. Therefore, there will be **no forwarding** to the portal of the DESY guest network from the webpage 'http://www.desy.de'.

> To register to the DESY guest network and to receive the login credentials, please click on "Receive your credentials by EMail".

Fill in the fields: last name, first name and email address and accept the DESY data protection provisions. Confirm your entry details with "**Register**". Your credentials will then be sent by email to the specified email address.

> For the following **five minutes** you have limited access to the Internet to retrieve your emails and access the login data.

> Return to the portal webpage of the DESY guest network (<https://guestnet-portal.desy.de>) and close the temporary connection via "**Terminate Connection**".

> You can now log in to the DESY guest network with your credentials. Fill in "**Login**" and "**Password**" and **accept** the DESY "Condition of Use". Please confirm with "**Enter**".

For the validity of the guest network account it is required to log in once per device. After that it is possible to use this device in the guest network during the following days without a renewed log in.

Note: A guest network account is valid up to **10 days** and can be used with **five devices** at the same time.

If anything should be unclear or in case you have questions, the UCO (User Consulting Office) will provide support by phone at **+49-40-8998-5005**, or by email to **uco@desy.de**.

TRIUMF-Helmholtz Workshop on Scientific Computing

- Held in parallel with related topic
- “Scientific Computing” getting a lot of interest nowadays!
- Interest also steered by politicians

TRIUMF-Helmholtz Workshop on Scientific Computing

16-17 September 2019
DESY
Europe/Berlin timezone

Overview

Timetable

Registration

↳ [Registration Form](#)

How to reach DESY

Accommodation

The 2018 TRIUMF workshop

Questions and support


✉ anita.teufel@desy.de

☎ +49 40 8998 3429


Scientific computing is a critical component of much of the work that takes place in particle physics at related subjects. In recent years, the amount of data produced across the globe has increased exponentially at research facilities and private businesses alike. With rapid advances in large-scale computing, big data, machine learning, and quantum computing, these technologies are beginning to have serious implications on how we do our work, and it is imperative that we remain part of this fast-changing field.

The Helmholtz Association is partnering with TRIUMF, Canadian and German universities and selected businesses to host a second workshop on selected topics in scientific computing at DESY in Hamburg, on 16/17 September 2019, to develop further collaboration and to explore new tools in scientific computing.

Note that **remote connections to all rooms** are provided. You can find the relevant connection details for each session in the detailed description of each session (click on the session and select "Session details") or by clicking on the small folder icon in the top-right corner of each session.



Starts Sep 16, 2019 08:00
Ends Sep 17, 2019 18:00
Europe/Berlin



DESY
Notkestr. 85, D-22607 Hamburg, Germany

<https://indico.desy.de/indico/event/22522/>

Good opportunity to widen horizon of our workshop!
→ **We will join in for two talks in the auditorium!**

Our Timetable

Mon 16/09	Tue 17/09	Wed 18/09	All days
Print	PDF	Full screen	Detailed view
08:00			
09:00	Registration Building 1b, SR4b, DESY Hamburg 08:45 - 09:10		
	Welcome/Introduction Building 1b, SR4b, DESY Hamburg 09:10 - 09:25		
	Talks: Reconstruction 1 Björn Wonsak Building 1b, SR4b, DESY Hamburg 09:25 - 10:15		
10:00	Coffee break Building 1b, SR4b, DESY Hamburg 10:15 - 10:45		
11:00	Talks: TRIUMF-Helmholz workshop. Keynote: Perspectives on the Future of Data Intensive Computing Oliver Oberst Building 5, Auditorium, DESY Hamburg 10:45 - 11:35		
12:00	Talks: Reconstruction 2 Dr. Xin Qian Building 1b, SR4b, DESY Hamburg 11:45 - 13:00		
13:00	Lunch Building 1b, SR4b, DESY Hamburg 13:00 - 14:30		
14:00	Talks: Talks: Reconstruction 3 Abigail Waldron Building 1b, SR4b, DESY Hamburg 14:30 - 16:00		
15:00			
16:00	DESY tour		

Mon 16/09	Tue 17/09	Wed 18/09	All days
Print	PDF	Full screen	Detailed view
09:00	Talks: TRIUMPF-Helmholz Workshop. Keynote: How to know, where to look - prioritising in computer vision Simone FRINTROP Building 5, Auditorium, DESY Hamburg 09:00 - 09:40		
10:00	Talks: Talks: Machine Learning 1 Fath Bay Building 1b, SR4b, DESY Hamburg 09:50 - 10:45		
11:00	Coffee break Building 1b, SR4b, DESY Hamburg 10:45 - 11:15		
12:00	Talks: Talks> Machine Learning 2 Dr. Oliver Schulz Building 1b, SR4b, DESY Hamburg 11:15 - 12:50		
13:00	Lunch Building 1b, SR4b, DESY Hamburg 12:50 - 14:20		
14:00	Talks: Talks: Machine Learning 3 Prof. Jianming Bian Building 1b, SR4b, DESY Hamburg 14:20 - 16:00		
15:00	Coffee break Building 1b, SR4b, DESY Hamburg 16:00 - 16:30		
16:00	Talks: Talks: Machine Learning 4 Joshua Renner Building 1b, SR4b, DESY Hamburg 16:30 - 18:00		
17:00			
18:00			

Mon 16/09	Tue 17/09	Wed 18/09	All days
Print	PDF	Full screen	Detailed view
09:00	Talks: Talks: Machine Learning 5 Viktor Pec Building 1b, SR4b, DESY Hamburg 09:00 - 10:50		
10:00	Coffee break Building 1b, SR4b, DESY Hamburg 10:50 - 11:20		
11:00	Talks: Talks: Machine Learning 6 Dr. Daniel Blick Building 1b, SR4b, DESY Hamburg 11:20 - 13:00		
12:00			
13:00			

Enough room for
lively
discussions!

19:45 Boarding for
Harbor-cruise

Motivation of Workshop

- **Machine learning experienced big advance in recent years**

→ Inspired a lot of work in our field

- **Big data is a key-issue** (in HEP & civil live)

→ Many problems can only be solved with some 'artificial' help

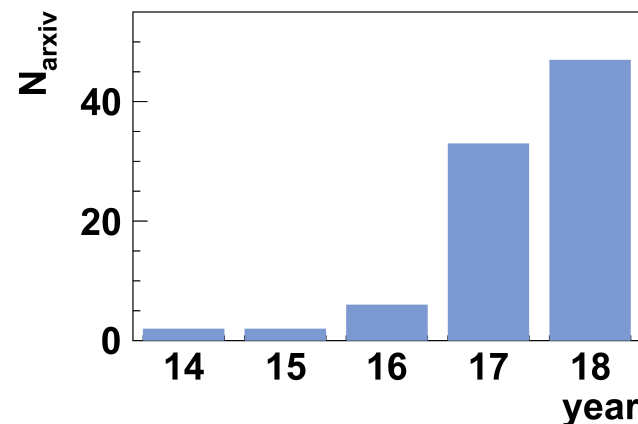
- **There is a kind of 'magic' to it:**

- Some things that used to take a lot of understanding and careful study seem to work almost automatically

(at least that was my first impression)

→ **Question:** Will my expertise in 'reconstruction' become useless?

deep learning in particle & astroparticle physics



Motivation of Workshop II

- **My answer:** No.
 - Still a lot of understanding needed!
 - Sometimes 'classical' methods have same performance but might be robuster
 - Probably there is an optimal way to combine both!
- → **My motivation:**
 - Want to learn the merits and flaws of both!
 - Want to understand best ways to combine them

Looking forward to all your interesting talks!

Back-up slides

Contact Persons

- **Overall organisation/Any kind of questions**
 - Björn Wonsak, Tel.: +49 179 7714574
- **Technical assistance during workshop**
(Upload of talks, ...)
 - David Meyhöfer
- **Registration, receipts and other documents:**
 - Petra Hinzer

Where to find Information

The screenshot shows a Mozilla Firefox browser window with the address bar displaying <https://indico.desy.de/indico/event/21853/>. The page title is "Reconstruction and Machine Learning in Neutrino Experiments (16-September 18, 2019) - Mozilla Firefox". The page content includes the logos of Universität Hamburg and DESY, the event title, and the dates "16-18 September 2019" at "DESY Hamburg". A sidebar on the left lists various event details under "Overview" and "Support". The main content area states "Registration closed!" and features a photograph of a city skyline at dusk. Below the photo, there is a source attribution and a paragraph about the workshop's aim. A notification at the bottom states: "Notification: A conference fee of 40€ will be collected during the registration in front of the seminar room used. Only cash will be accepted."

Reconstruction and Machine Learning in Neutrino Experiments

16-18 September 2019
DESY Hamburg
Europe/Berlin timezone

Overview

- Scientific Programme
- Call for Abstracts
- View my abstracts
- Timetable
- Book of abstracts
- Accommodation
- Transportation
- Venue
- Visa - Invitation
- Social Event - Dinner

Support

- bjoern.soenke.wonsak-
- david.meyhoefer@des-

Registration closed!

Source: priotography - Flickr: www.flickr.com/photos/priotography/435504045/ - (CC BY 2.0)

The aim of this workshop is to bring together the expertise in reconstruction techniques and machine learning methods collected in the neutrino community. Many of the current and next generation neutrino detectors will have the abilities of fine grained detectors combined with large volumes. This offers unique opportunities but is also a challenge for reconstruction and event analysis. Here we want to collect an overview of modern approaches to this task.

We especially encourage young scientist in presenting their work and using the opportunity to establish valuable contacts.

Notification: A conference fee of 40€ will be collected during the registration in front of the seminar room used. Only cash will be accepted.

- <https://indico.desy.de/conferenceDisplay.py?confId=21853>