



Yandex



Welcome to MLHEP'19!

2019-07-01, DESY

Andrey Ustyuzhanin

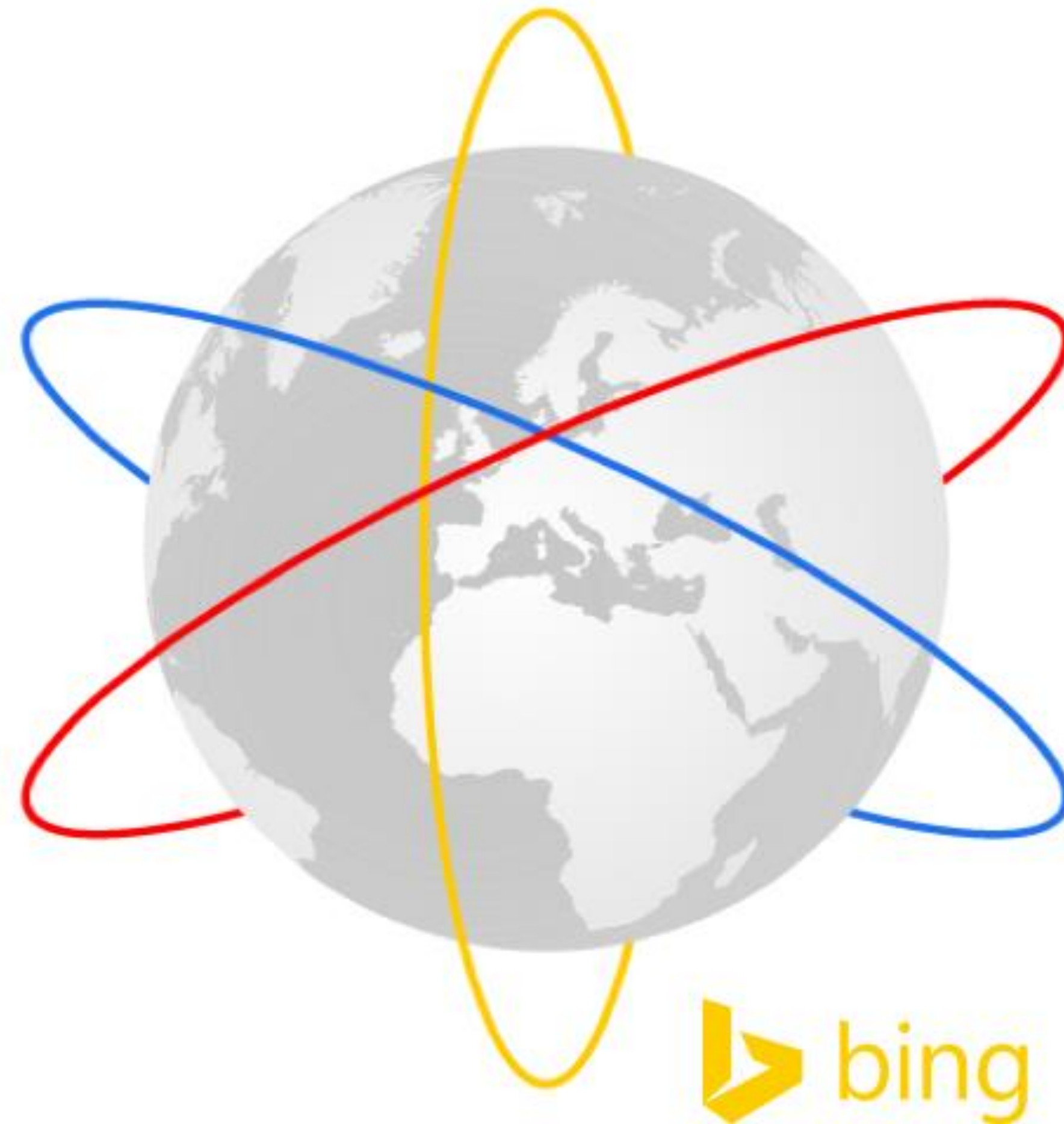
NRU HSE

YSDA

ICL

Global Search Engines

Google



Yandex

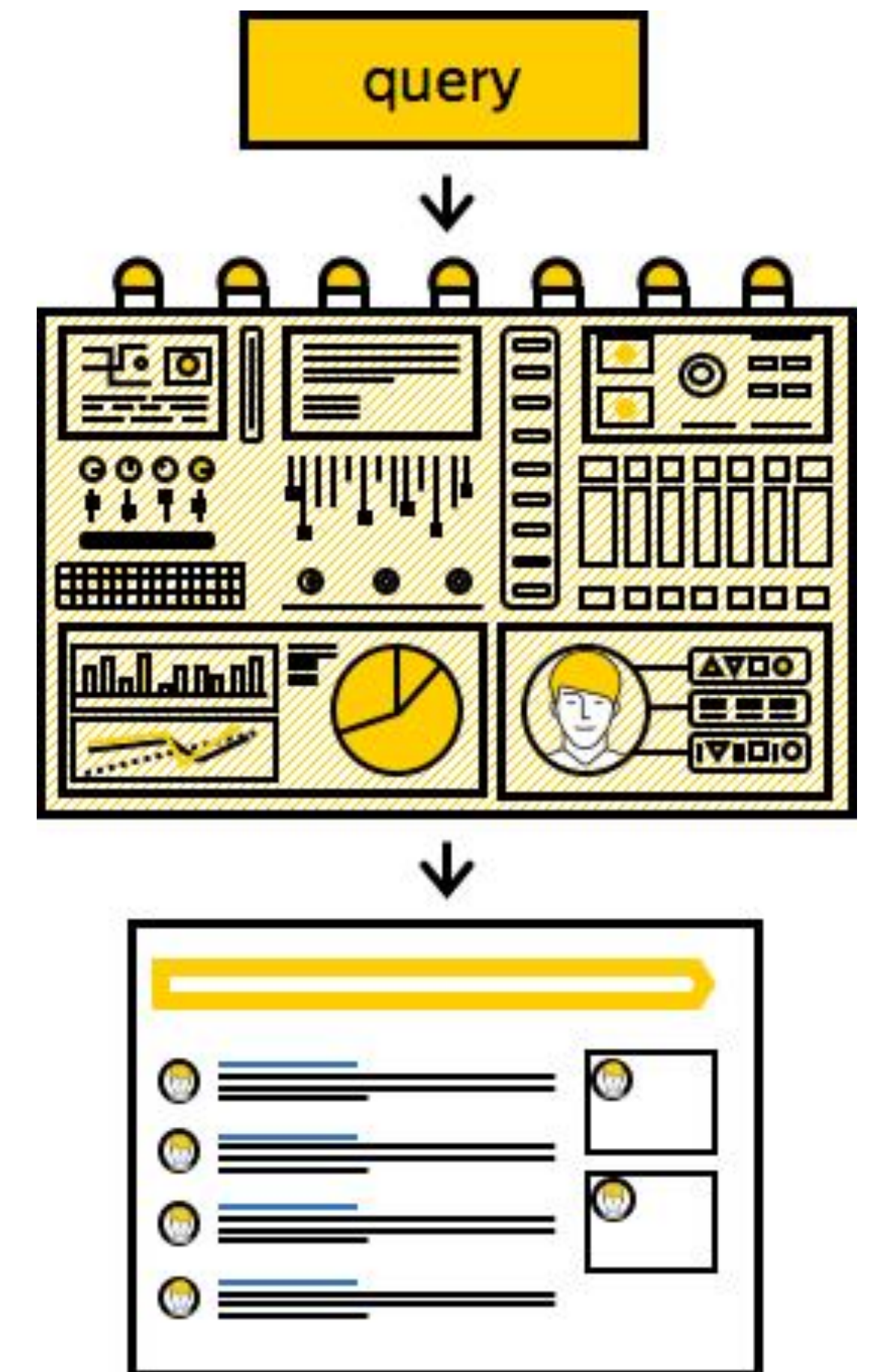
Machine Learning at Yandex

Search Engine tasks:

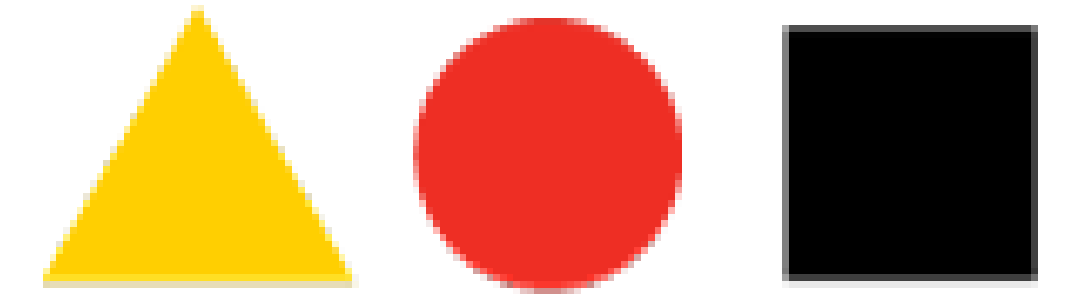
- Processing of the entire web ($\sim 10^{10}$ pages, <http://www.worldwidewebsize.com>)
- Aggregation of users on behaviour analytics and micro-segmentation ($\sim 10^8$ - 10^9)
- Personalized delivery of relevant URLs/Images/Ads with the highest click probability

Internal Machine learning application examples:

- Navigation / maps
- Natural Language Translation
- Speech recognition/ synthesis
- Music streaming / recommendation
- Weather prediction ("nowcasting")
- Ya.Taxi – demand prediction for specific space-time region, driving cars
- Self-driving car
- Voice Assistant "Alice"



Yandex School of Data Analysis



SCHOOL OF DATA ANALYSIS

Established in 2007. Focuses the field of Statistics, Machine Intelligence and Deep Learning

Joint master's program with leading Russian universities

2 years, 12+ courses (<https://yandexdataschool.com/edu-process/program>)

Algorithms & Data Structures

Programming Languages (C++ and Python)

Machine Learning

Big Data Storage & Processing

Information Retrieval

Deep Learning

Reinforcement Learning

Admission:

4000 applications per year

250 are accepted per year

~600 graduated so far

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Яндекс



HSE Faculty of Computer Science

Established in March 2014,

Active support from Yandex (more than 50 lecturers/seminarists are Yandex employee)

> Also cooperates with Kaspersky, WorldQuant, Huawei, ...

Goal: enter the world's top 30 Computer Science faculties by 2020

> big data storing and processing,

> software development and system programming,

> machine learning

370 students enter bachelor program per year

~100 graduate master's program per year

Member of LHCb collaboration since June 2018

International Partner Universities

Humboldt-Universität zu Berlin
Technische Universiteit Eindhoven
Technische Universität Dresden
Université Grenoble Alpes
Université Blaise Pascal, Clermont Ferrand
Radboud University, Nijmegen
Aalto University, Helsinki
Lappeenranta University of Technology

Laboratory of Methods for Big Data

Analysis

Group working on data analyses in Natural sciences

4 physicists and 15 computer scientists

Close partnership with Yandex School of Data Analysis

Collaborates with LHCb, SHiP, OPERA, NEWS, CRAYFIS

experiments

Project examples:

- Storage/Speed optimization for triggers
- Particle Identification algorithms
- Ultra-High Energy Cosmic Ray Detection
- Fast MC Generation

Open for internships!

MLHEP - iterative training experiment

2015 - Academic University, Saint Petersburg, Russia



2016 - Lund University, Sweden



LUND
UNIVERSITY

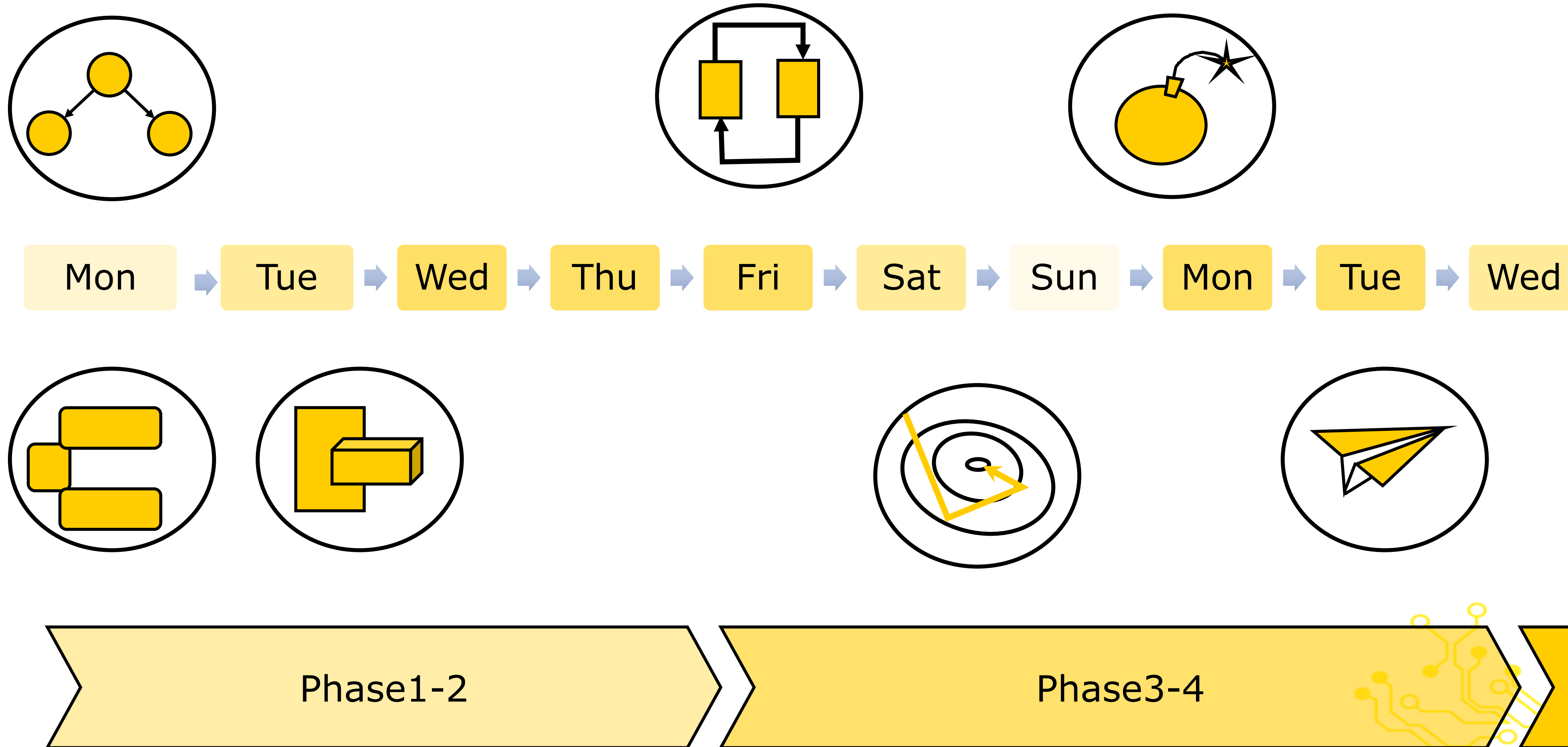
2017 - Imperial College London, Reading, UK

Imperial College
London

2018 - St Ann College, Oxford, UK



MLHEP 2019 timeline

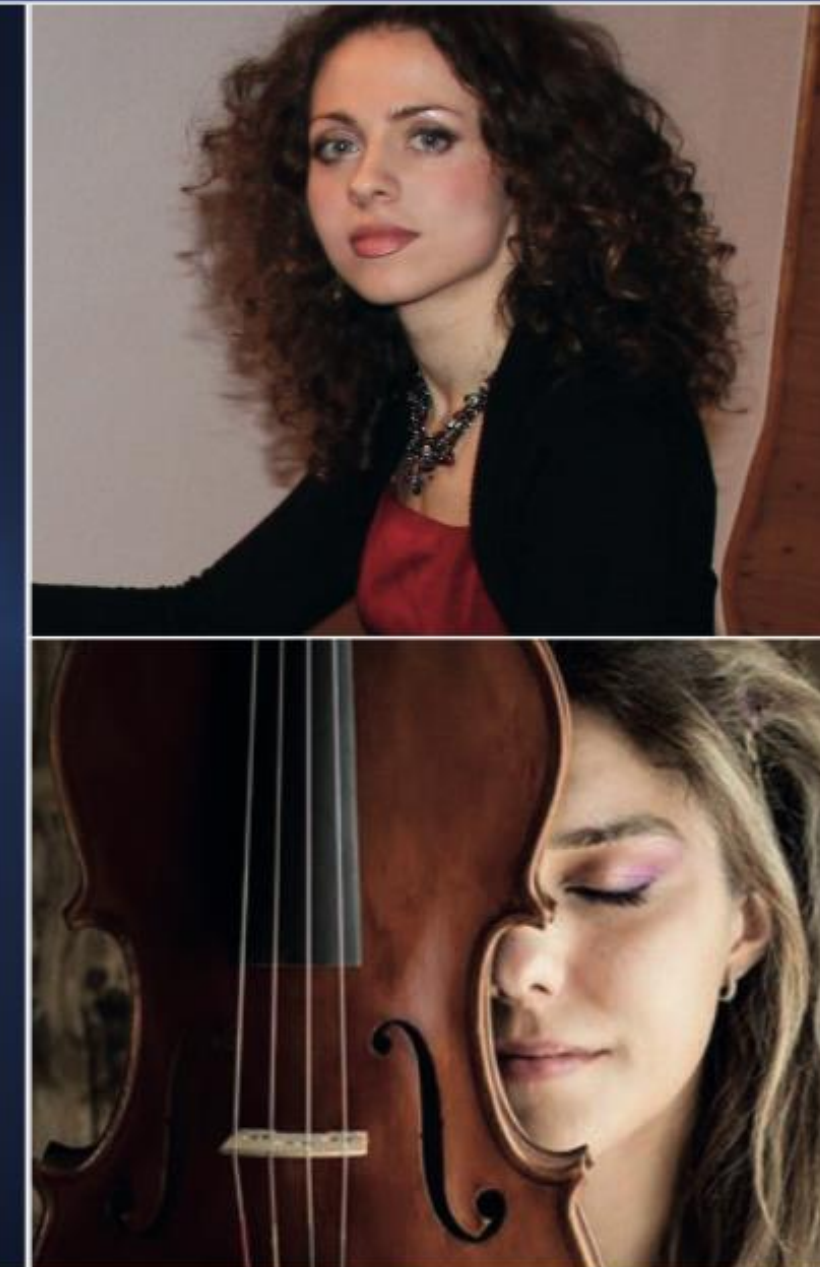
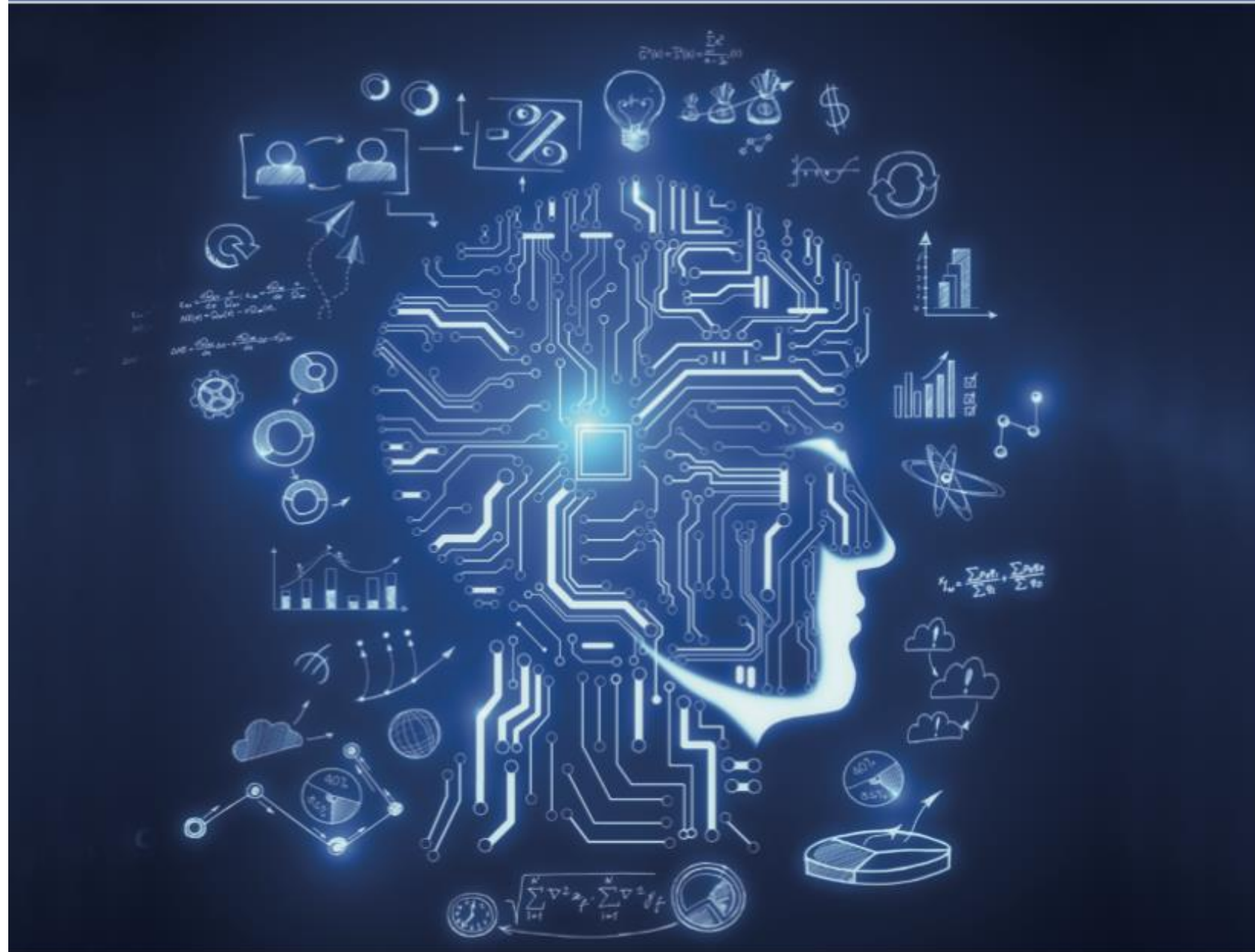


Sunday event

Artificial Intelligence: Past, Present and Future

7 July 2019

DESY, Hamburg,
Auditorium, 17-20 h



Lecture by Prof. Pierre Baldi, Univ. California Irvine
Artificial Intelligence (AI) is everywhere from search engines, to translation systems, to self-driving car. This lecture will explore the nature of AI, its relations to natural intelligence, the boundary between what AI can do today and what it cannot do, and how we got to this point. It will also examine possible future directions of research towards better AI systems, with an eye on fairness, interpretability, and safety.

Before and after the lecture:
Classical music Intermezzos
with Olga Krzefski, Piano and
Sabina Bakholdina, Violin

Music by Dvorak, Brahms, Piazzolla, Massnet,
Gardel, Kreisler, Rubinstein and Elgar.

The lecture will be followed by a panel discussion on
Machine Learning for Research in Fundamental Physics

<https://www.terascale.de/ml2>

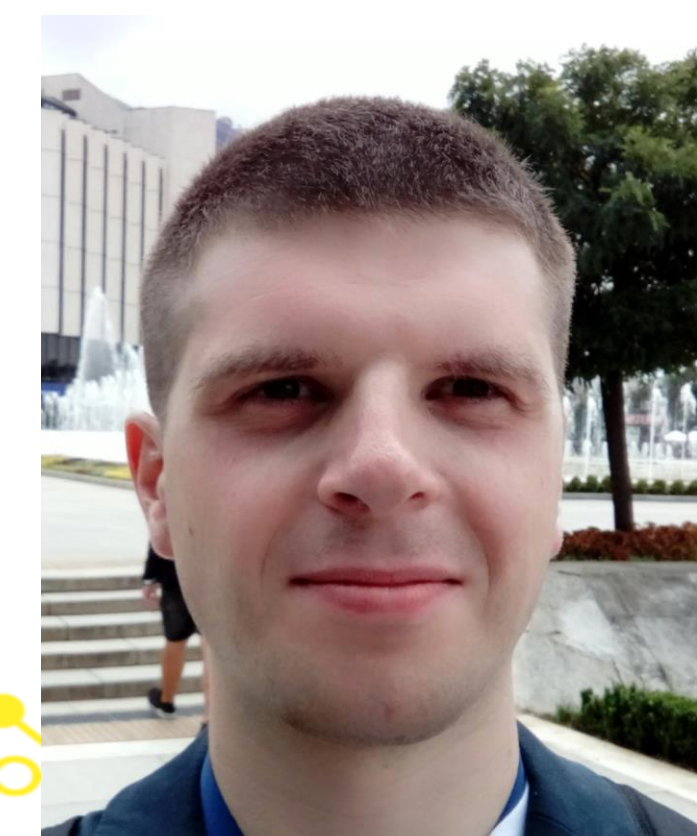
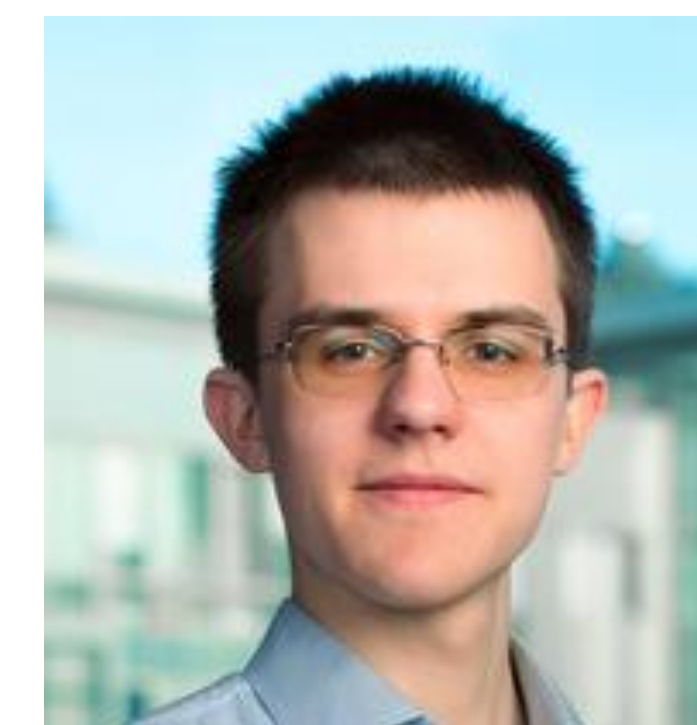
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Want more? Ask us how

Dr. Alexey Artemov, Skoltech, HSE
Dr. Artem Maevsky, HSE
Maxim Borisyak, YSDA
Nikita Kazeev, YSDA, HSE
Vladislav Belavin, HSE
Mikhail Hushchyn, HSE, YSDA
Dr. Andrey Ustyuzhanin, YSDA, HSE, ICL

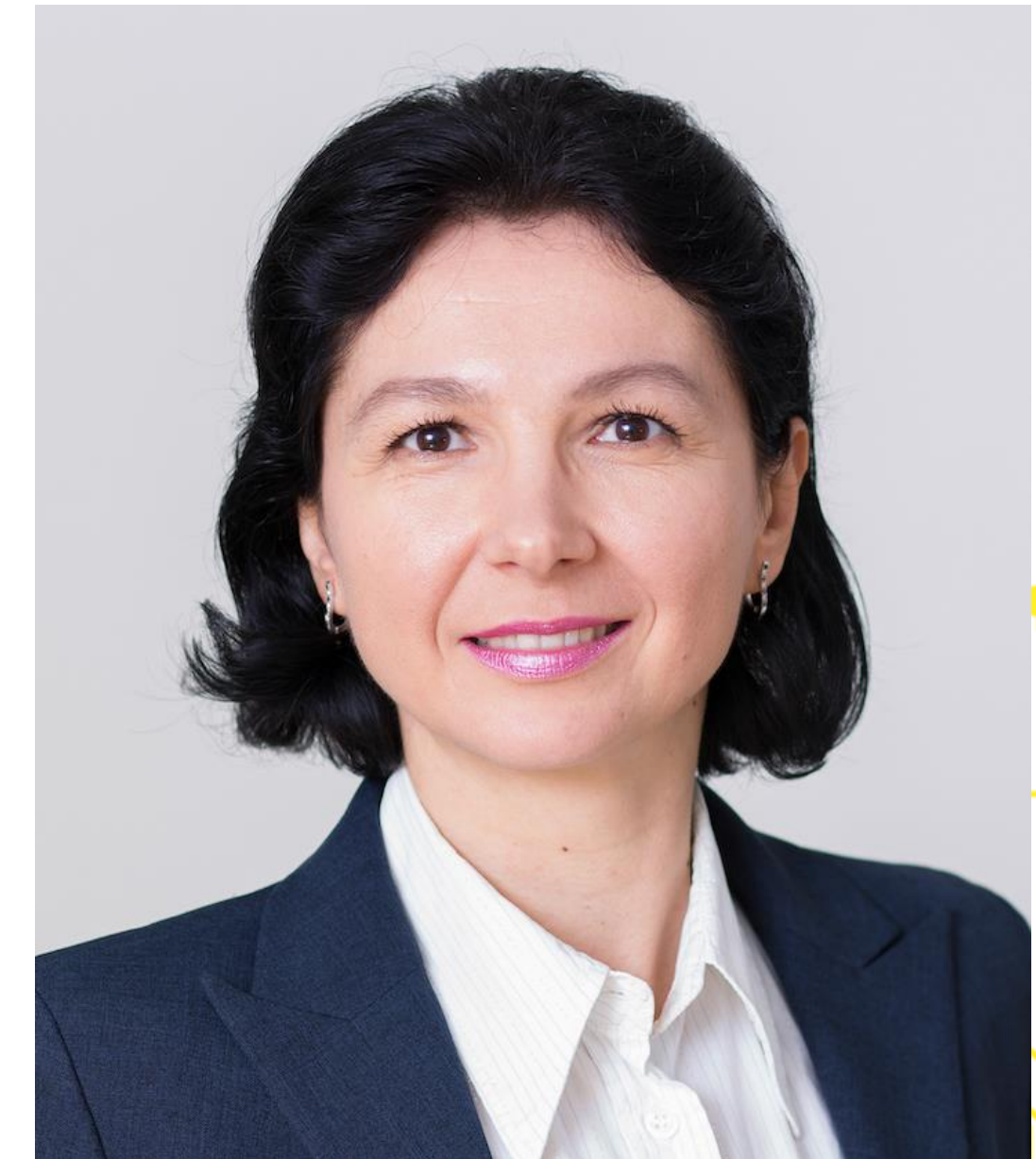


DESY Team



Dr. Isabell Melzer-Pellmar

Inna Henning



Andrey Ustyuzhanin

Important Items

Repository with slides and notebooks:

> <https://github.com/yandexdataschool/mlhep2019>

Distributed intelligence

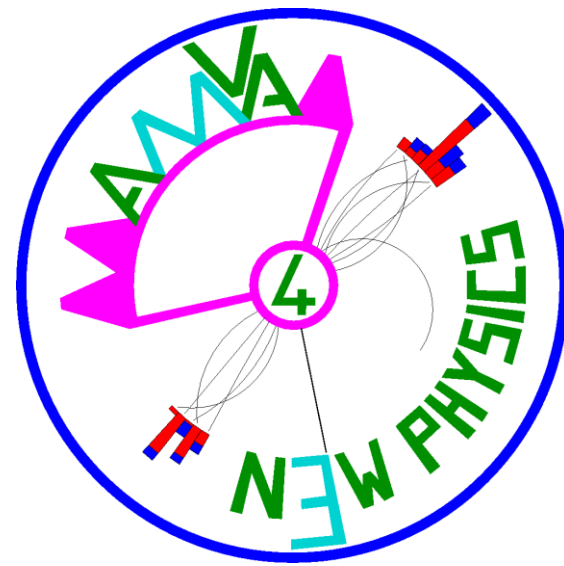
> <https://t.me/joinchat/DMMgwheJKrVrNJq6JcDsLA>

Social network tags

> #mlhep2019 , #mlhep

Reception this evening!

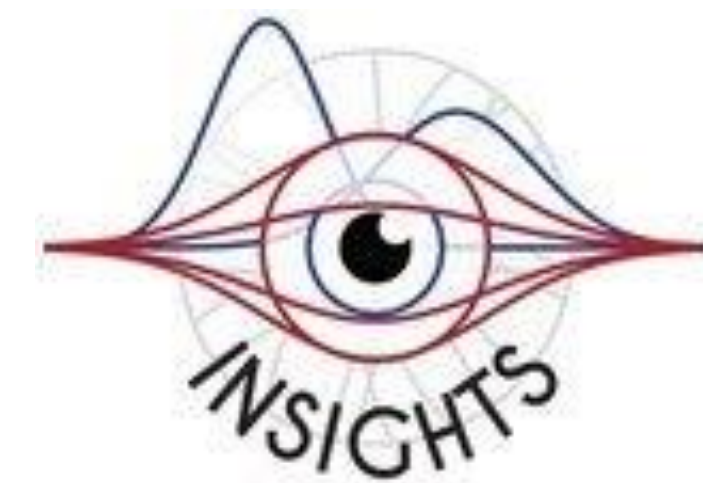
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<https://amva4newphysics.wordpress.com>



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