

The Wigner GPU Laboratory presents:

6th Lectures on Modern Computing in Science on Quantum Computers & Algorithms



Wigner Research Centre for Physics, Budapest, Hungary, 21-22 November 2019

The Wigner GPU Laboratory



The aim of the Wigner GPU Laboratory is to provide support for any fields in science in sense of parallel computing techniques, especially for faster numerical calculations in gravitational and high-energy physics, astronomy, astrophysics, material sciences, and detector simulations. We have started with GPU technologies in 2009, but later our aim was improved to any kind of parallel computing technology. Today, many- and multi-core, GPU, FPGA, Xeon Phi technologies are all available in the laboratory. Beside the academic environment and other institutes, we have connections to industrial partners as well.

See more: <http://gpu.wigner.mta.hu>

History



- 2005-2008 Idea of using GPU in HEP calculations
Starting of the WLCG Grid (ALICE & CMS) Tier-2 at the Wigner
- 2009 Discussion with GGB & P. Lévai & G. Debreczeni
2 main direction: HEP & Gravity
- 2010- 1st GPU Day & formation of the Wigner GPU Laboratory
Students: M. F. Nagy(-Egri) & D. Berényi
- 2010- GPU Day series
- 2016- Lectures on Modern Computing in Science series
2016- Wigner GPU Lab Fellowship
- 2019- New staff (B. Kacskovics, B. Szigeti, G. Bíró)

The Staff



Barnaföldi, Gergely Gábor

LEADER OF THE LOCAL ALICE GROUP AND
GPU LAB.



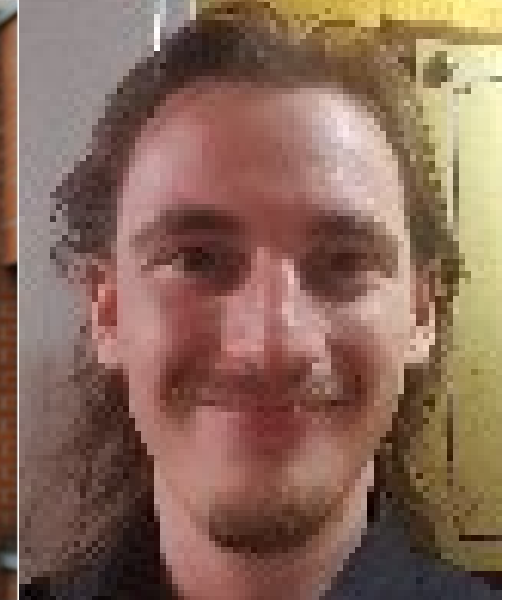
Kacskovics, Balázs

PHD HALGATÓ, RENDSZERGAZDA



Szigeti, Balázs

MSC HALGATÓ, RENDSZERGAZDA



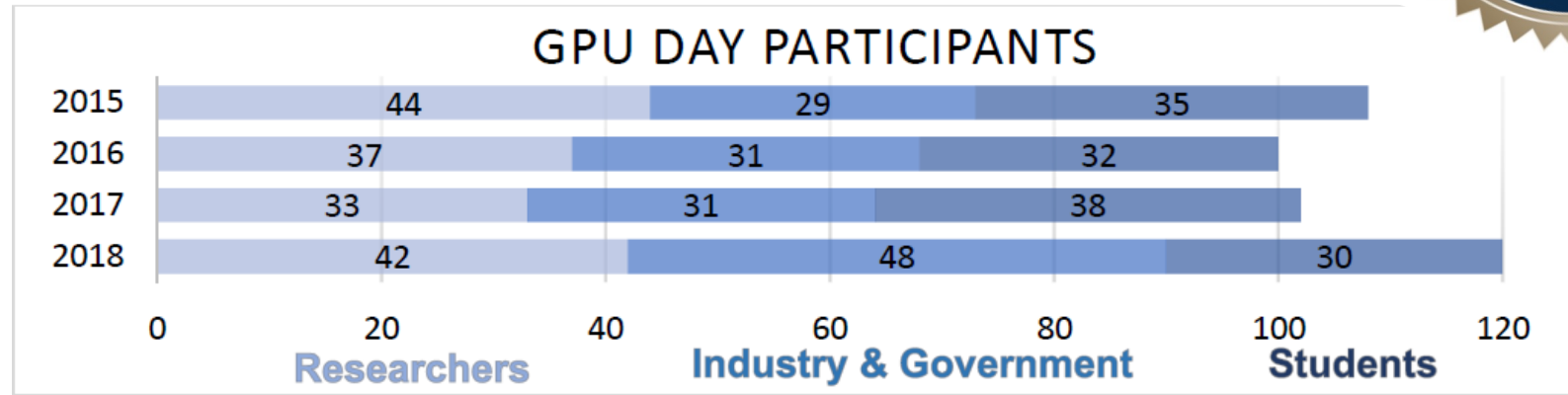
Gábor, Bíró

PHD HALLGATÓ, RENDSZERGAZDA

In numbers



- 6 Lectures on Modern Computing in Science
- 9 GPU Days



- 18 Wigner GPU Lab Fellowship
 - 12 finished fellowships
 - 6 running fellowships
- 22+ industrial & academic partners (Lombiq LTD, Khronos, CERN)
- 21+ scientific publications and program codes

Academic & Industrial Partners





QUANTUM COMPUTING AND ALGORITHMS

QUANTUM PROGRAMMING IN PYTHON

HANDS-ON CLOUD QUANTUM COMPUTING

WIGNER: ZOLTÁN ZIMBORÁS
GERGELY GÁBOR BARNAFÖLDI
GÁBOR BÍRÓ
BALÁZS KACSKOVICS
BALÁZS SZIGETI
FEAT: JÁNOS ASBÓTH (BME)
LÁSZLÓ OROSZLÁNY (ELTE)
ANDRÁS PÁLY (BME)



Nature isn't classical, dammit, and if you want to make a simulation of nature, you'd better make it quantum mechanical, and by golly it's a wonderful problem, because it doesn't look so easy.

— *Richard P. Feynman* —

AZ QUOTES

WILD PREDICTION

The effort to build quantum computers, and to understand their capabilities and limitations, will lead to a major conceptual advance in our understanding of QM (one that hasn't happened yet)

You'll recognize the advance because it will look like science, not philosophy



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Map of the KFKI Campus

- Restaurants

- Wigner RCP Building 3 (Tanácsterem)

- Main gate of the campus

