

Annual Meeting of the BMBF-funded Research Compound “Föderiertes Computing für die ATLAS- und CMS-Experimente am Large Hadron Collider in Run-3



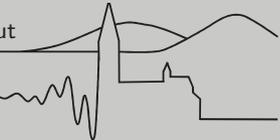
Welcome and Introduction

Albert-Ludwigs-Universität Freiburg

Markus Schumacher
27. February 2023

Physikalisches Institut

Albert-Ludwigs-
Universität Freiburg



UNI
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Agenda for today's meeting

09:00 → 09:10 **Welcome and Introduction**

Speakers: Markus Schumacher (Albert Ludwigs Universitaet Freiburg (DE)), Gunter Quast (KIT - Karlsruhe Institute of Technology (DE))

 intro-a+c-run-3-lhc-m...

09:15 → 09:20 **Remarks by PT-DESY**

Speaker: Salome Shokri-Kühni (PT-DESY)

09:30 → 09:40 **Aachen Report**

Speaker: Andreas Nowack (Rheinisch Westfaelische Tech. Hoch. (DE))

09:45 → 09:55 **Freiburg Report**

Speaker: Michael Boehler (Albert Ludwigs Universitaet Freiburg (DE))

10:00 → 10:10 **Göttingen Report**

Speaker: Sebastian Wozniowski (Georg August Universitaet Goettingen (DE))

10:15 → 10:25 **Hamburg Report**

Speakers: Hartmut Stadie (Hamburg University (DE)), Johannes Lange (Hamburg University (DE))

10:30 → 10:40 **Karlsruhe Report**

Speaker: Artur Il Darovic Gottmann (KIT - Karlsruhe Institute of Technology (DE))

10:45 → 11:00

Coffee / Tea break

11:00 → 11:10 **München Report**

Speakers: Guenter Duceck (Experimentalphysik-Fakultaet fuer Physik-Ludwig-Maximilians-Uni), Guenter Quast (KIT - Karlsruhe Institute of Technology (DE))

11:15 → 11:25 **Wuppertal Report**

Speaker: Mustafa Andre Schmidt (Bergische Universitaet Wuppertal (DE))

11:30 → 11:40 **DESY Report**

Speaker: Thomas Hartmann (Deutsches Elektronen-Synchrotron (DE))

11:45 → 13:00 **Discussion (Plans for current and upcoming research compound)**

 discussion-a+c-run-3...

Greetings and remarks by PT-DESY
Cordial welcome to Dr. Salome Shokri-Kuehni!

Reports by partners of research compound
→ collect information for preparing the common intermediate report for time period October 2021 → December 2022 (1 to 2 pages general part to be written by Günter Q. and M.S. until end of March)

Discussion of cooperation in current compound and preparation for next funding period 2024-2027

Verbundantrag

Föderiertes Computing für die ATLAS- und CMS-Experimente am Large Hadron Collider in Run-3

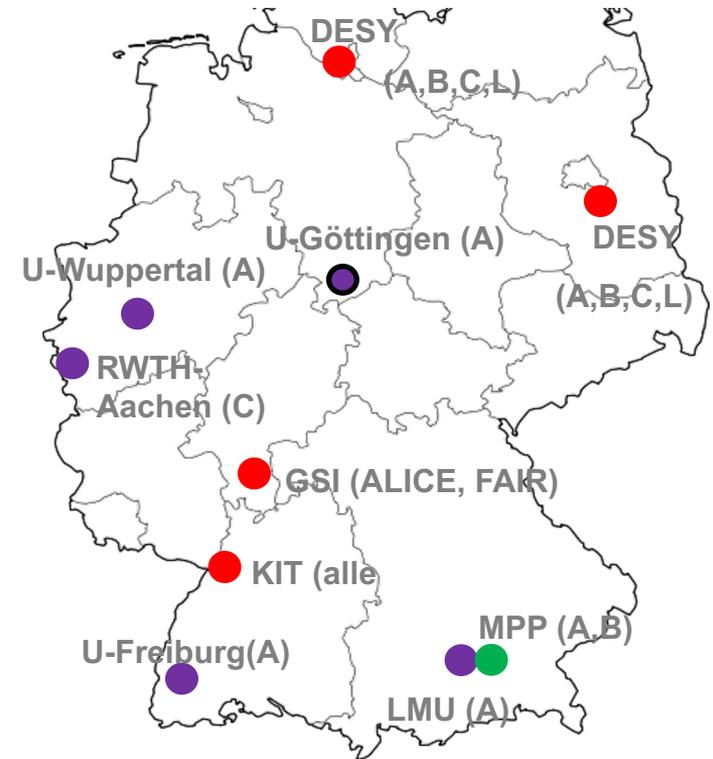
Gemeinsamer Antrag der folgenden Gruppen

- Rheinisch-Westfälische Technische Hochschule Aachen (Physikalische Institute IB, IIIA und IIIB), Prof. Dr. Alexander Schmidt
- Albert-Ludwigs-Universität Freiburg (Physikalisches Institut), Prof. Dr. Markus Schumacher*
- Georg-August-Universität Göttingen (II. Physikalisches Institut), Prof. Dr. Arnulf Quadt
- Universität Hamburg (Institut für Experimentalphysik), Prof. Dr. Johannes Haller
- Karlsruher Institut für Technologie (Institut für Experimentelle Teilchenphysik), Prof. Dr. Günter Quast **
- Ludwig-Maximilians-Universität München (Fakultät für Physik), Prof. Dr. Otmar Biebel
- Bergische Universität Wuppertal (Fakultät für Mathematik und Naturwissenschaften), Prof. Dr. Christian Zeitnitz

Assoziierte Partner sind

- Deutsches Elektronensynchrotron DESY, Hamburg und Zeuthen, Prof. Dr. Volker Gülzow
- Karlsruher Institut für Technologie (Steinbuch Centre for Computing - GridKa), Prof. Dr. Achim Streit
- Max-Planck-Institut für Physik, München, Prof. Dr. Siegfried Bethke

A=ATLAS B=BELLE C=CMS L=LHCb



Helmholtz-Centres DESY, (GSI), KIT
Max-Planck-Institute for Physics Munich
5 Universities

Provisioning of WLCG-Resources (Pledges April 2023)

Tier-1-Centre GridKa at KIT: 15% of all worldwide WLCG Tier-1 Resources

(CPU 520 kHS06 Disk 53 PB Tape 121 PB (+ 56 GPUS NVIDIA V100))

GridKa share to WLCG.: ALICE 25%, ATLAS 12,5%, CMS 10%, LHCb 17% oriented at fraction of authors

Tier-2-Centes: (315 kHS06 Disk 27 PB)

	Share to Exp.	CPU [kHS06]	Disk [PB]	Sharing in Germany [%]		
ALICE	10,2%	63	6,1	GSI 100		
ATLAS	12,5%	210	19,8	DESY 29	MPP 14	4 Unis 57
CMS	7,5%	108	8,7	DESY 66		1 Uni 34
LHCb	16,7%	20	35 TB	DESY 100		
Belle	14,0%	56	2,7	DESY 45	MPP 10	GridKa 45

The university share shall on intermediate timescale be replaced by resources at Helmholtz centres (storage) and usage of NHR Centres (CPU)

- Requirement from and pledges to WLCG always fulfilled
- Excellent operation for ≥ 15 years with very high availability and reliability
- Important contributions to experiment specific R&D within collaborations
- Contribution of universities of high importance for operation and R&D but also for education and recruitment of young scientists in the area of federated HPC and

What we applied for in Funding Period 2021-2024

Personal for experiment specific operation and R&D activities

Gruppe	Core-Beitrag	Produktion	T1-Betrieb	Analyse-Support	Entwicklung	Koordination	Summe
Freiburg				0,4	0,6		1,0
Göttingen			0,8*	0,4	0,3		1,5
München	1	0,4		0,4		0,2	2,0
Wuppertal	1	0,2		0,4	0,2	0,2	2,0
Summe	2	0,6	0,8	1,6	1,1	0,4	6,5

Gruppe	Tier1 spez. Aufgaben	GridKa-Kontakt	Tier2 spez. Aufgaben	Nutzerunterstützung	Summe
Aachen IB			0,5		0,50
Aachen IIIA			0,5	0,25	0,75
Aachen IIIB			0,5	0,5	1,00
Hamburg			1,0	1,0	2,00
Karlsruhe	2,5	0,5			3,00
Summe	2,5	0,5	2,5	1,75	7,25

will be needed at at least same level for funding period 2024→2027

Invest for providing hardware resources

Experiment	Jahr	CPU [HEPSPEC06] jeweils Erweiterung +	Speicher [TB] Ersatz = Summe	Invest [kEuro] pro Institut
ATLAS (x4)	2022	5003 + 9469 = 14499	300 + 333 = 633	180
CMS	2022	2948 + 5992 = 8940	161 + 1027 = 1188	200
ATLAS (x4)	2023	2883 + 1755 = 4638	370 + 194 = 569	120
CMS	2023	4462 + 2305 = 6767	369 + 50 = 419	100
ATLAS (x4)	2024	5168 + 4715 = 7887	426 + 367 = 793	150
CMS	2024	5131 + 3736 = 8867	424 + 227 = 651	150

Whether invest for hardware is needed in new funding period depends on timeline of realisation of KET Strategy Paper on „Computing in HL-LHC Era“

→ discussion session at the end of meeting

Networking and cooperation

Experiment overarching:

- Close and regular cooperation of ATLAS and CMS computing experts in GridKa Overview Board, GridKa Technical Advisory Board, KET Computing&Software Panel
→ valuable input for KET Strategy Paper on “Computing in HL-LHC Era”
- Additional meetings at e.g. DPG spring meetings, Annual meeting of Helmholtz Alliance „Physics at th Terascale“, ...
- Close contact to ERUM-FSPs ATLAS and CMS, LHC-ERUM-FSP Office
e.g. annual FPS meetings, contribution to exhibitions at fairs („Hannover Fair“, „ISC Hamburg“)
- Regular exchange with partners of research compound FIDIUM (all partners are also partners in FIDIUM)
- Annual meeting of our compound

Do we need more regular and official meetings of this compound / or at least of group leaders?

Experiment internal:

- Weekly and monthly operation meetings of cloud around GridKa
- Computing and Software weeks, ATLAS and CMS computing related meetings, ...
- ...