

KSETA Plenary Workshop 2014

Johannes Blümer

KIT-Center Elementary Particle and Astroparticle Physics KCETA



142 registrants

Welcome!

AKBIYIK, Melike

AMSTUTZ, Christian

ANSTRUTHER, Yasmin

BAEHR, Steffen

BECKER, Juergen

BELLM, Johannes

BERGER, Joram

BIERWEILER, Anastasiya

BIRD, Ian

BISCONTI, Francesca

BLÜMER, Johannes

BOESER, Christian

BORNSCHEIN, Beate

BÄUMI, Julia

142 registrants

Welcome!

WARR, David

WAYAND, Stefan

WEINHEIMER, Christian

WEINREUTER, Matthias

WERNER, Felix

WIEGAND, Christoph

WILLIAMSON, Shawn

WOEHRMANN, Hauke

WUESTLING, Sascha

YANG, Lu

ZEISSLER, Stefan

ZEPPENFELD, Dieter

ZIEGLER, Michael

ZILLES, Anne

ZOLLER, Max

Monday, February 24, 2014

10:00 - 11:00 Arrival

11:00 - 11:15 Coffee

11:15 - 12:15 Welcome and Introduction

Conveners: Prof. Johannes Blümer (IKP), Prof. Ulrich Nierste (TTP)

12:15 - 13:45 Lunch

13:45 - 14:45 Composition of space-time 1h0'

Speaker: Gia Dvali (LMU)

14:45 - 15:45 Talks by doctoral researcher or PostDocs

14:45 **High-precision activity monitoring of the KATRIN tritium source by beta induced x-ray spectrometry** 20'

Speaker: Marco Roellig (ITEP)

15:15 **Radiation hard silicon detectors** 20'

Speaker: Martin Printz (IEKP)

15:45 - 16:15 Coffee

16:15 - 17:15 Discovery of a Higgs boson - The role of theory 1h0'

Speaker: Robert Harlander (Univ. Wuppertal)

17:15 - 18:15 Talks by doctoral researcher or PostDocs

17:15 **First evidence for Higgs decays into Tau leptons** 20'

Speaker: Joram Berger (IEKP)

17:45 **CLARA - Enhancing the Sensitivity of Raman Spectroscopy for Tritium Gas Analysis** 20'

Speaker: Simone Rupp (ITEP)

18:15 - 22:15 Black Forest Games (Albtal Arena)

We will walk about 15 minutes to the Albtal Arena and play some funny games typical for the Black forest region. Please see <http://albtal-arena.de/>

Tuesday, February 25, 2014

09:00 - 10:00	LHC Computing: Achievements and Outlook for the Future 1h0' Speaker: Ian Bird (CERN)
10:00 - 11:00	Talks by doctoral researcher or PostDocs
10:00	How helicopters help chasing cosmic rays 20' Speaker: Felix Werner (IKP)
10:30	Ultra fast X-ray imaging of dynamic processes in science with GPUs 20' Speaker: Mr. Matthias Vogelgesang (IPE)
11:00 - 11:30	Coffee
11:30 - 12:30	Probing inflation with the cosmic microwave background 1h0' Speaker: Sarkar Subir (Oxford)
12:30 - 14:00	Lunch
14:00 - 15:00	Talks by doctoral researcher or PostDocs
14:00	The radio sound of cosmic rays 20' Speaker: Daniel Huber (IKP)
14:30	Importance of LHC data for interpreting air shower measurements 20' Speaker: Felix Riehn (IKP)
15:00 - 16:00	Particle detectors - trends for the future and lessons of the past (cancelled) 1h0' Speaker: Christoph Rembser
16:00 - 16:30	Coffee
16:30 - 18:30	Parallel working groups <i>10 - 12 doctoral researcher, 2 - 3 PI's</i> <i>discussion on the work within KSETA, what is better with KSETA than without, what could be improved</i>
18:30 - 19:30	Dinner
19:30 - 20:30	Meetings: PI+EB, General assembly of Fellows

Wednesday, February 26, 2014

- 09:00 - 10:00 **Neutrino physics 1h0'**
Speaker: David Wark (Oxford)
- 10:00 - 11:00 **Talks by doctoral researcher or PostDocs**
- 10:00 **Rare decays of B mesons 20'**
Speaker: Thomas Herrmann (TTP)
- 10:30 **First measurements with the KATRIN spectrometer 20'**
Speaker: Stefan Groh (IEKP)
- 11:00 - 11:30 **Coffee**
- 11:30 - 12:30 **Talks by doctoral researcher or PostDocs**
- 11:30 **Stabilität des Grundzustands im Standardmodell 20'**
Speaker: Max Zoller (TTP)
- 12:00 **The transition from a galactic to an extra-galactic origin of cosmic rays 20'**
Speaker: Sven Schöo (IKP)
- 12:30 - 14:00 **Lunch**
- 14:00 - 15:00 **Astroparticle physics 1h0'**
Speaker: Christian Weinheimer (Univ. Münster)
- 15:00 - 16:00 **Talks by doctoral researcher or PostDocs**
- 15:00 **The new data acquisition system for the EDELWEISS Dark Matter experiment 20'**
Speaker: Mr. Bernhard Siebenborn (Karlsruhe Institute of Technology)
- 15:30 **Atmospheric Influence on Cosmic Ray Detection 20'**
Speaker: Stefanie Falk (IKP)
- 16:00 - 16:30 **Coffee**
- 16:30 - 17:00 **Reporting on results of the working groups 30'**
Speaker: Rapporteurs
- 17:00 - 17:30 **Farewell 30'**

7 Institute:

IEKP, IKP, IPE, ITEP, SCC, TP, TTP

360 Köpfe, ~ 37 M€ Budget

14 Professoren, 3 Nachwuchsgp.

Verhältnis CN:CS $\approx$ 50%

Infrastruktur:

Tritium Labor Karlsruhe (TLK); GridKa

2 Helmholtz-Programme:

Astroteilchenphysik;

Elementarteilchenphysik

2 Helmholtz-Allianzen:

Terascale + HAP Astroteilchenphysik

DFG Graduiertenkolleg GRK 1694

SPK, LGK

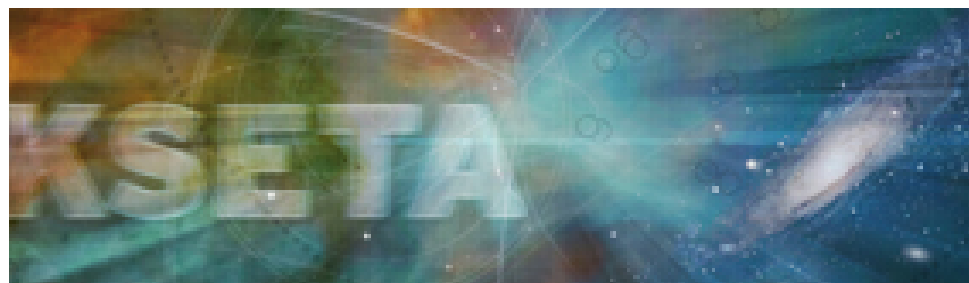
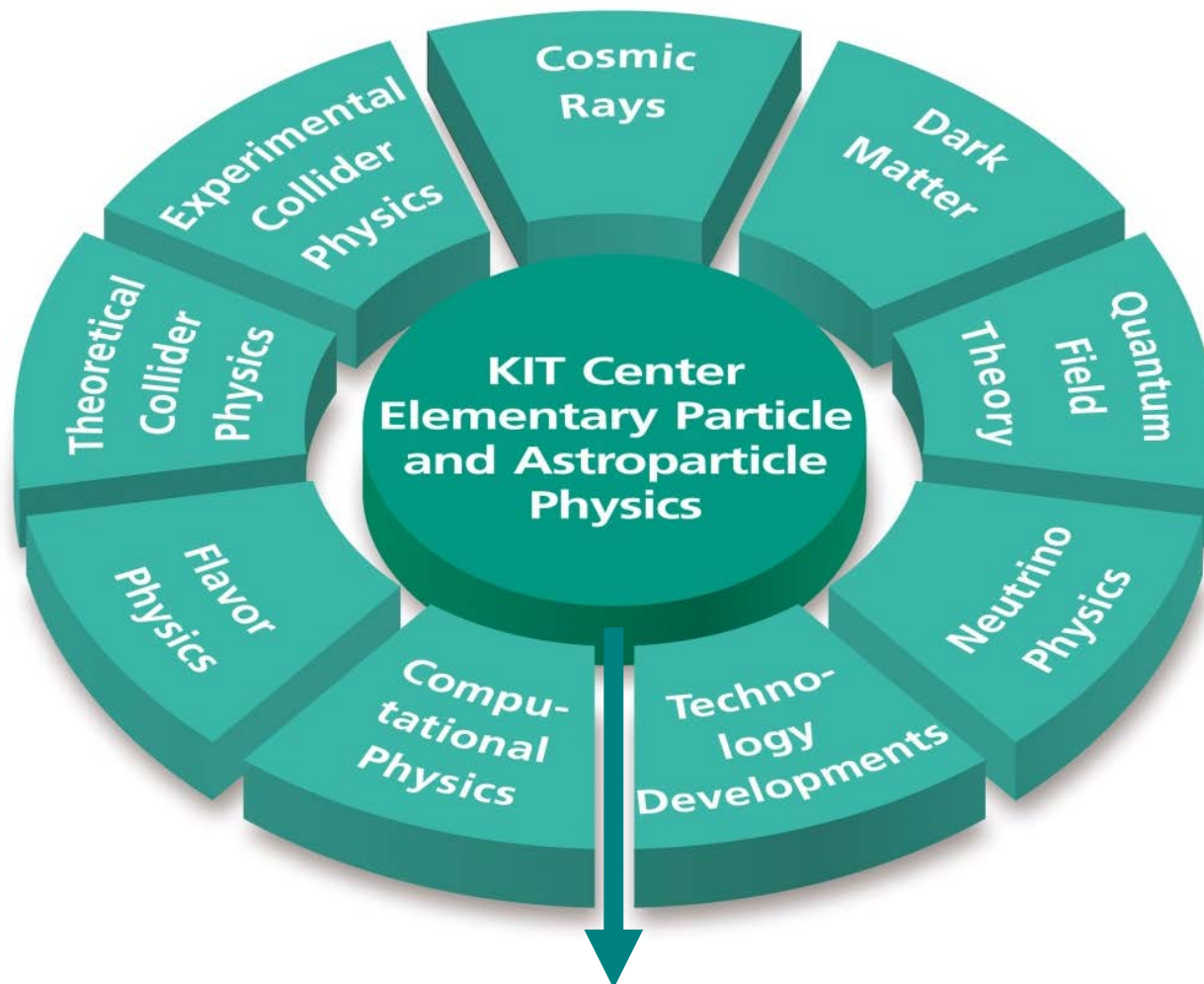
DFG Sonderforschungsbereich SFB/TR9

BMBF Verbundforschung

Theorie, Astroteilchenphysik

BMBF Forschungsschwerpunkt 102 (CMS)

DFG Graduiertenschule KSETA



From KCETA to KSETA

■ Department of Physics

KCETA
core

- Institute of Experimental Nuclear Physics (IEKP)
- Institute of Nuclear Physics (IKP)
- Institute of Theoretical Particle Physics (ITTP)
- Institute of Theoretical Physics (ITP)
- Institute for Data Processing and Electronics (IPE)

■ the Steinbuch Centre for Computing (SCC)

■ Department of Informatics:

- Institute of Telematics

■ Department of Electrical Eng. and Information Technology

- Institute of Micro- and Nanoelectronic Systems (IMS)
- Institute of Technical Physics (ITEP)
- Institute of Information Processing Technology (ITIV)

■ Department of Chemical and Process Engineering

- Institute for Technical Thermodynamics and Refrigeration

KSETA

KSETA: “deeper–broader–better”

**D e v e l o p c o u r s e p r o g r a m s f o r t h e
i n d i v i d u a l**

KSETA: “deeper–broader–better”

Deeper

professional specialisation,
contact to leading experts,
topical courses...



D e v e l o p c o u r s e p r o g r a m s f o r t h e
i n d i v i d u a l

KSETA: “deeper–broader–better”

Deeper

professional specialisation,
contact to leading experts,
topical courses...



Broader

professional knowledge,
look-around, understand
the others...



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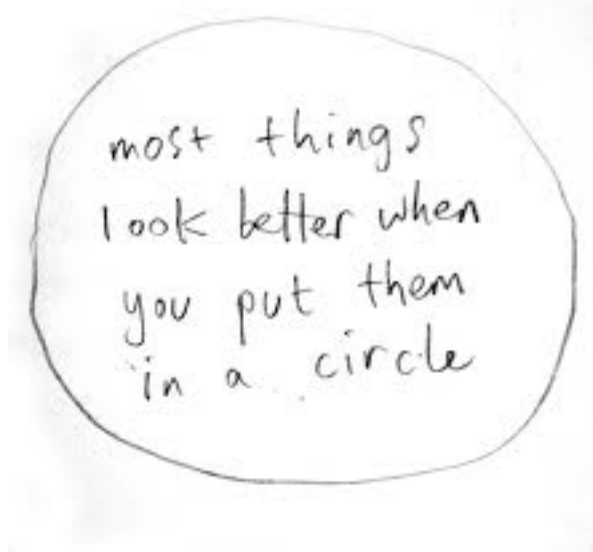
Broader

professional knowledge,
look-around, understand
the others...



Better

personality, soft
skills, career
planning, ...



**D e v e l o p c o u r s e p r o g r a m s f o r t h e
i n d i v i d u a l**

We exist since 14 months...

Deutsche Forschungsgemeinschaft · 53170 Bonn

An die Präsidenten des
Karlsruher Instituts für Technologie (KIT)
Herrn Professor Dr. Eberhard Umbach
Herrn Professor Dr. Horst Hippler
Kaiserstraße 12
76131 Karlsruhe



Der Präsident

Prof. Dr.-Ing. Matthias Kleiner

Deutsche
Forschungsgemeinschaft

Kennedyallee 40
53175 Bonn

Telefon: +49 228 885-2222
Telefax: +49 228 885-3002
matthias.kleiner@dfg.de
www.dfg.de

Fragen beantwortet:
Dr. Anjana Buckow
Telefon: +49 228 885-2845
anjana.buckow@dfg.de

GZ: GSC 1085/1

02.07.2012 3ke

Nachrichtlich:

Herrn Professor Dr. Johannes Blümer, Karlsruhe

Graduiertenschule 1085 "Karlsruher Graduiertenschule für Elementarteilchen- und Astroteilchenphysik: Wissenschaft und Technologie", Karlsruhe

Förderung in den Haushaltsjahren 2012 (ab 1. November) bis 2017 (bis 31. Oktober)

Ihr Antrag vom 5. September 2011 (Eingangsdatum)

Sehr geehrte Herren Präsidenten,

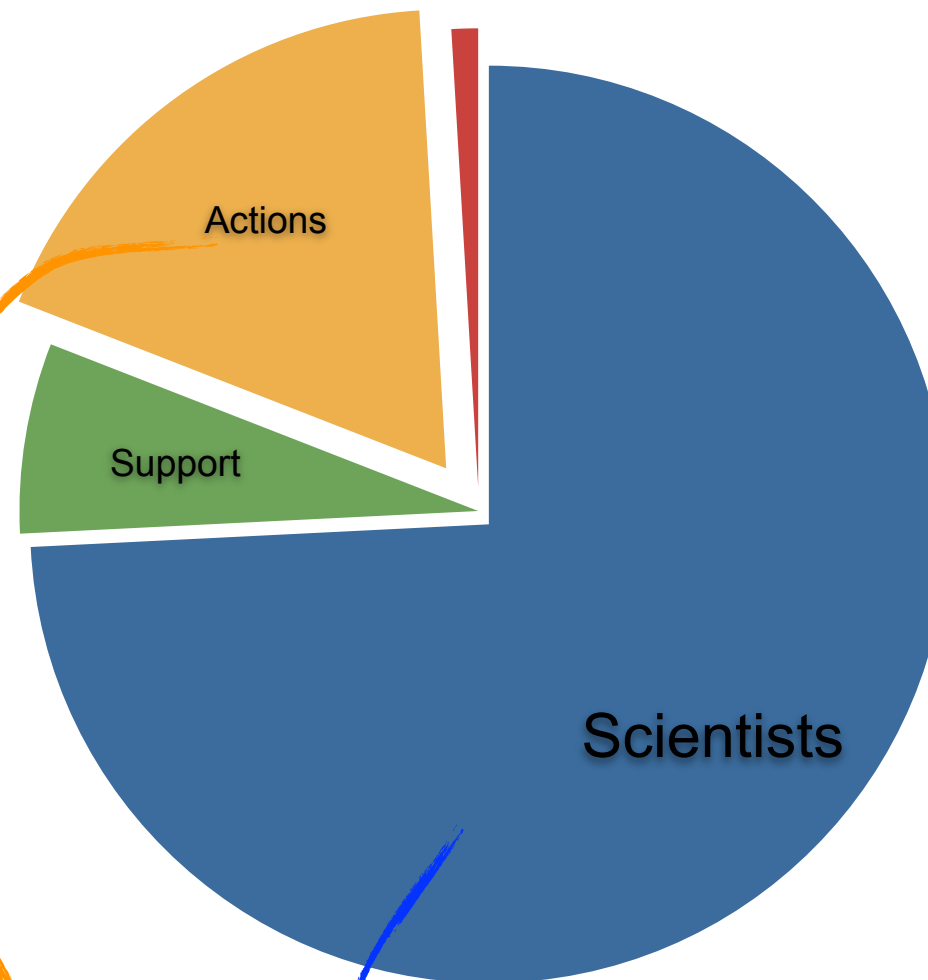
ich freue mich, Ihnen mitteilen zu können, dass der Bewilligungsausschuss Exzellenzinitiative in seiner Sitzung am 15. Juni 2012 die Einrichtung und Finanzierung der Exzellenzeinrichtung

GSC 1085 "Karlsruher Graduiertenschule für Elementarteilchen- und Astroteilchenphysik: Wissenschaft und Technologie"

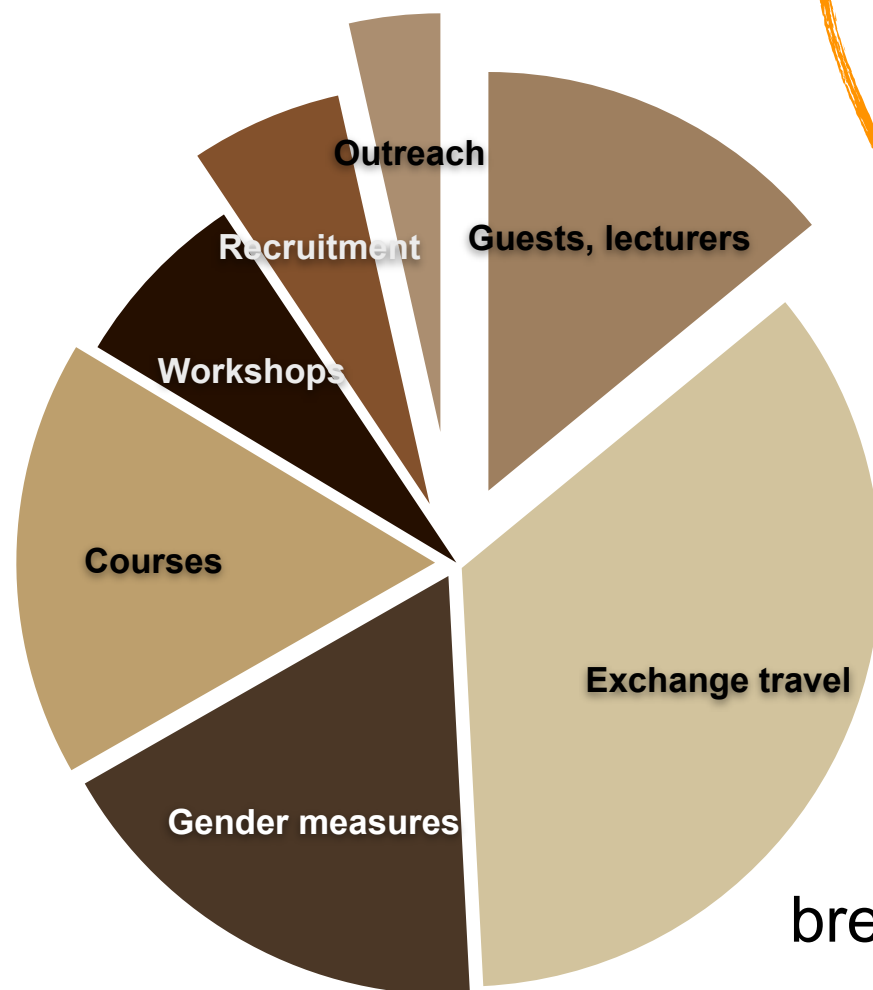
zum 1. November 2012 beschlossen hat.

KSETA funding

Global distribution ►
(7.4 M€ in 5 years)

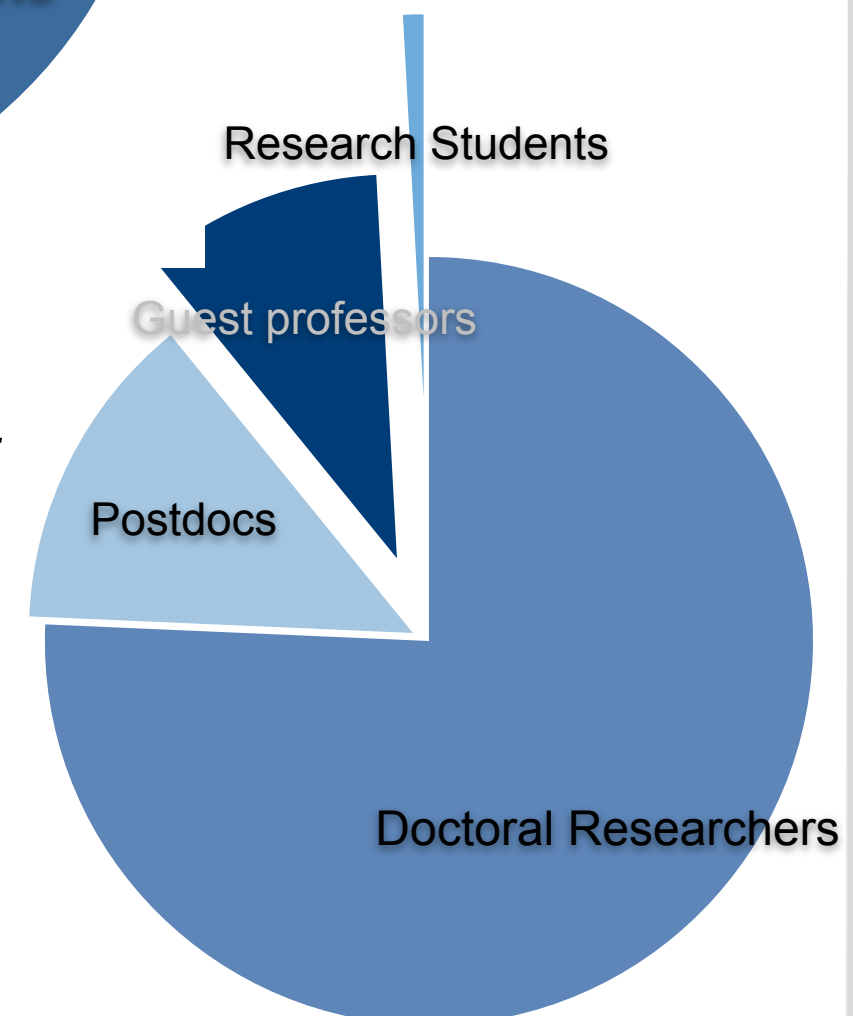


● Scientists
● Support
● Actions
● Comms



breakdown of 'actions'

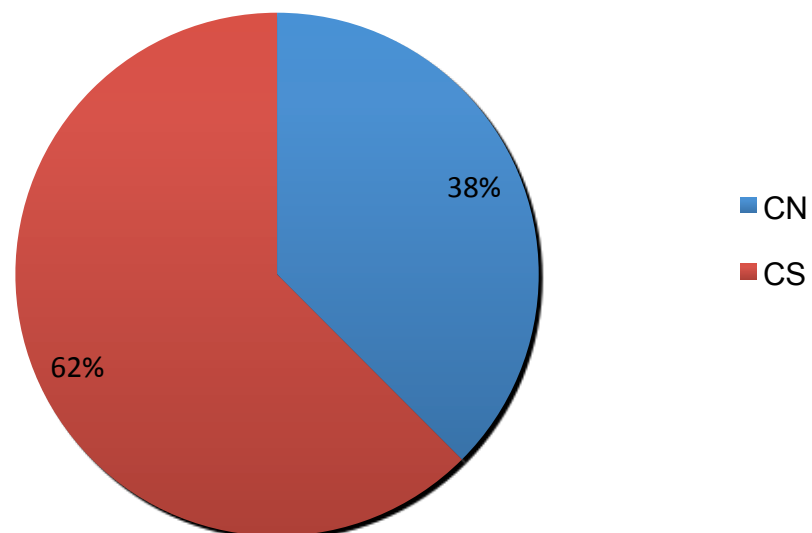
breakdown of
'scientists'



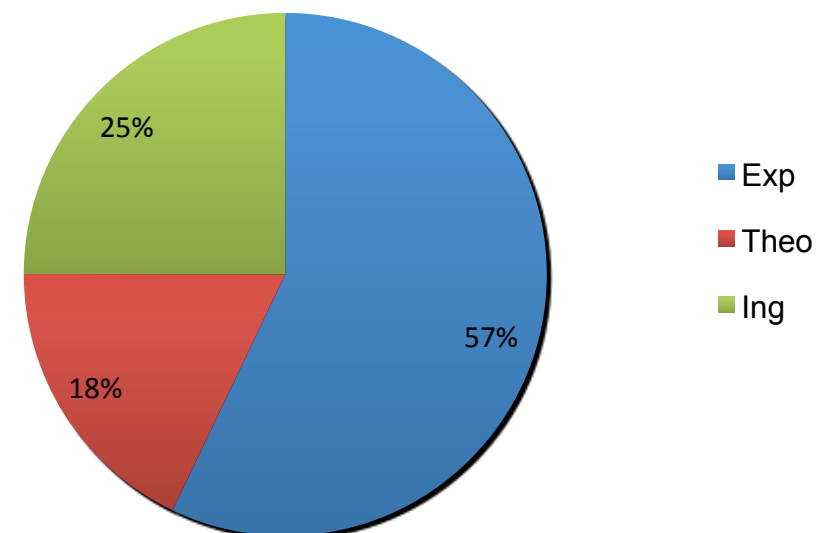
909 person-months have been granted

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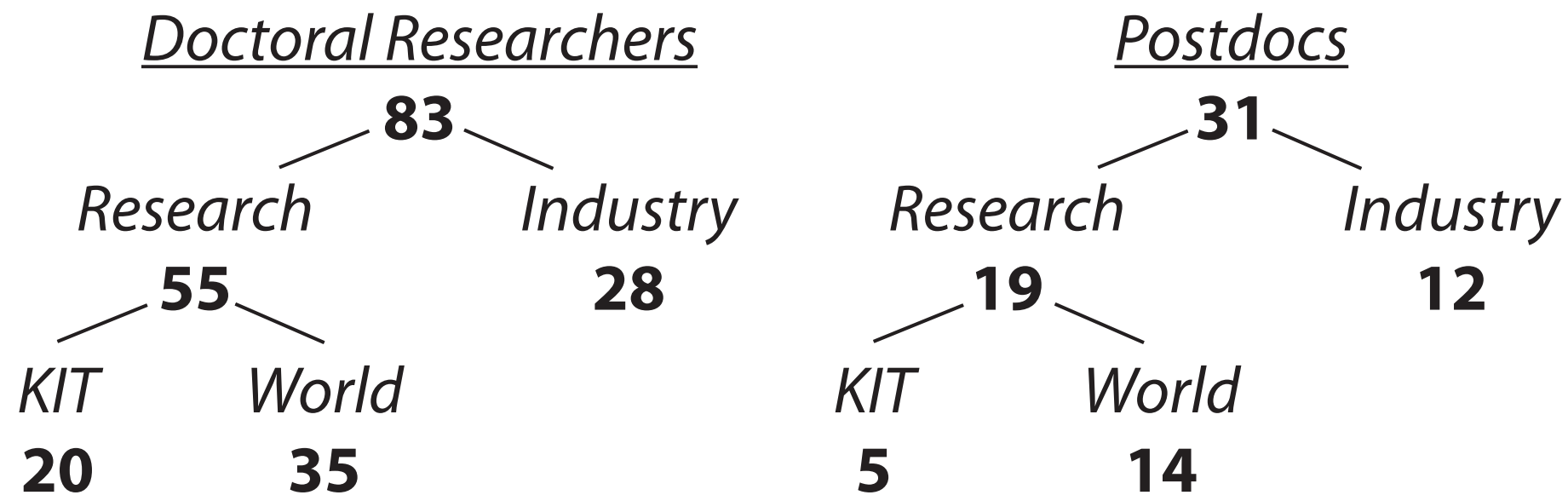
Persons-months by Campus North, Campus South



Person-months by research category



Career steps



trace them better | KIT Alumni

KSETA in a living international network

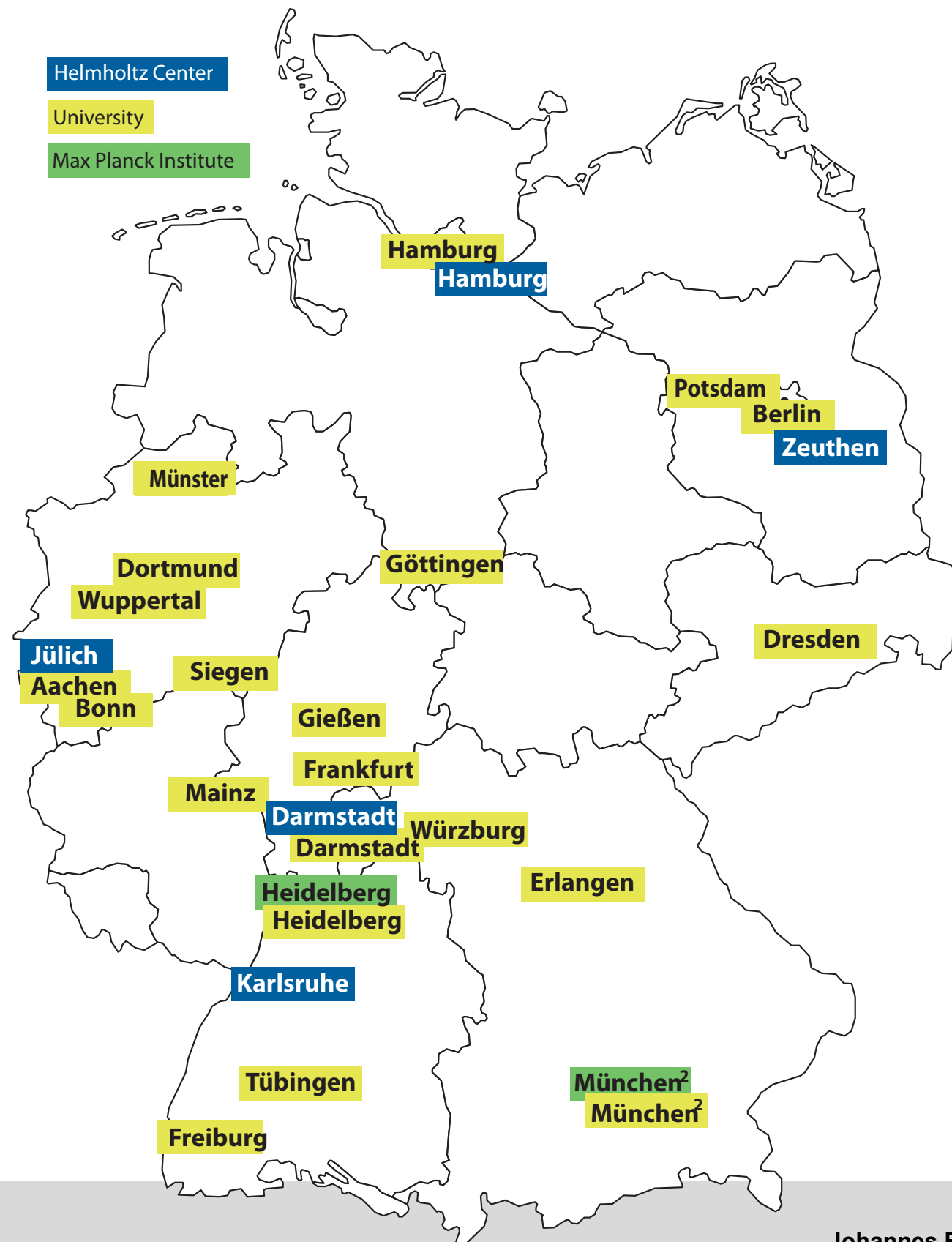


HELMHOLTZ
ASSOCIATION
Terascale Alliance
Astroparticle Alliance



active network of partners
cooperation statement
exchange of ideas, people
complementary skills
visibility

Helmholtz Alliances



Partner	Tera-scale	EMMI	HAP
DESY	x		x
KIT	x		x
GSI		x	
Jülich		x	
Aachen	x		x
Berlin HU	x		x
Bonn	x		x
Darmstadt		x	
Dortmund	x		x
Dresden	x		x
Erlangen-Nürnberg			x
Frankfurt FIAS		x	
Frankfurt U		x	
Freiburg	x		
Giessen	x		
Göttingen	x		
Hamburg	x		x
Heidelberg	x	x	
Heidelberg MPIK		x	x
Mainz	x		x
München TUM			x
München LMU	x		
München MPE			x
München MPP	x		x
Münster		x	x
Potsdam			x
Siegen	x		x
Tübingen			x
Würzburg	x		x
Wuppertal	x		x
Regensburg	x		
B. Aires, ITEDA, Argentina			x
Paris, APC, France			x
Paris, Univ. VI, France		x	
Tokyo, Univ., Japan		x	
Tokyo, RIKEN, Japan		x	
Troitsk INR, Russia			x
Moscow, SINP, Russia			x
Berkeley, LBNL, USA		x	
JINA, USA		x	
Chicago, KICP, USA			x

Karlsruhe House of Young Scientists

■ KHYS for doctoral researchers:

- Information and Advice
- Internationalization and Networking
- Independence and Initiative
- Further Education and Career Development

■ KHYS tools for KIT:

- Quality Assurance



*important asset for the School:
the courses of type "better"*

Elements of KSETA (cf. Satzung)

- der Sprecher (Coordinator),
- zwei stellvertretende Sprecher (Deputy Coordinator),
- der Geschäftsführer (Managing Director),
- der Vorstand (Executive Board),
- der Wissenschaftliche Rat (Board of Researchers),
- das Zulassungsgremium (Admission Panel),
- die Doktorandenversammlung
(Plenum of Doctoral Researchers)
- der Beirat (Advisory Board)



KSETA Fellows – rights and duties

The Karlsruhe School of Elementary Particle and Astroparticle Physics: Science and Technology (KSETA) is the Graduate School of the KIT Center Elementary Particle and Astroparticle Physics (KCETA). The school covers the fields of elementary particle physics, astroparticle physics and related advanced technologies. The school's distinguishing feature is the joint doctoral research of young physicists and engineers on thesis topics centered around large-scale projects of particle and astroparticle physics.

The leitmotiv of the school is the optimal training of young researchers for careers in science and industry through research within international interdisciplinary large-scale projects.

The doctoral researchers may enter the school with a Master or Diploma degree in physics, electrical engineering, informatics/computer science, or another degree qualifying her or him for research in KCETA. Our training program for doctoral researchers follows the motto DEEPER · BROADER · BETTER.

DEEPER: the doctoral researchers will learn the state-of-the-art of their individual fields of research.

BROADER: the School will bridge the gaps of knowledge between physicists and engineers to build a strong basis for their common research. BETTER: the School will improve the individual and social skills of its members.

1. KSETA doctoral fellow

The doctoral fellows of KSETA are young researchers rather than students. All doctoral researchers from the participating institutes, who compile a doctoral thesis related to the research fields, belong to KSETA. All KSETA Doctoral Fellows, whether paid from the school (KSETA doctoral researcher) or from other sources (KSETA Kollegiat), have the same privileges and duties and enjoy the same benefits, including full access to the training program and to the travel funds. The doctoral researchers will receive their PhD degrees from the participating faculties.

2. Admission

The admission procedure is the responsibility of the *Admission Panel (AP)*, which consists of all members of the Executive Board and further principal investigators covering all research fields in KSETA. The Admission Panel is elected by the *Board of Researchers (BR)*, consisting of all principal investigators of KSETA. The formal requirement to enter the School is a Master or Diploma degree in physics, electrical engineering, informatics or any other discipline of science or engineering related to KCETA research. Interested students may apply at any time and their application will be handled in the following AP meeting. In addition, several announcements for PhD positions are made over the year and their deadlines are correlated with the AP meetings.

The AP also decides upon the admission of KSETA Kollegiaten (doctoral researchers paid by other sources than KSETA) and a short-term employment (1 – 6 months) of PostDocs. The application procedure for a KSETA PhD position is described on the KSETA home page www.kseta.kit.edu and in the attached document "KSETA-Personaleinstellung".

Management

■ KSETA

- Irmgard Langbein, Barbara Lepold, Astrid Chantelauze, Beatrix von Puttkamer

■ KCETA

- Irmgard Langbein, Andreas Haungs

■ ASTRO, Matter and the Universe

- Andreas Haungs, Bianca Keilhauer, Irmgard Langbein

■ HAP

- Bianca Keilhauer, Andreas Haungs, Astrid Chantelauze

EB₁₆ AP₂₉ PI₄₃

11 institute secretaries/
admins

Claudia Schäfer

KCETA Advisory Board

Ursula Bassler

Laura Baudis

Martin Beneke

Lucia di Ciaccio

Masaki Fukushima

Francis Halzen

Joachim Mnich

Ken Peach

Georg Raffelt

Reinhold Rückl

IRFU/CEA Saclay

U Zürich

TU Munich

CERN, Geneva

ICRR Tokyo

U Madison

DESY Hamburg

U Oxford

MPI München (Dpt. Chair)

U Würzburg (Chair)

Institute	Elementary Particle Physics	Astroparticle Physics	Technologies	20 Professors with 23 experienced scientists	Department
IEKP	experimental collider physics, flavor physics; CMS, BELLE	cosmic rays, Dark Matter, neutrinos; K-G, JEM-EUSO, Auger, KATRIN, EDELWEISS, AMS	Adv. statistics, neural networks, grid computing, silicon detectors, air shower detectors, β -spectroscopy	Blümer, Drexlin, de Boer, Feindt, Husemann, Müller, Quast, Weber with Gex , Gebauer, Hartmann, Kuhr, Wagner-Kuhr	Physics
ITTP	QFT, theoretical collider and flavour physics, precision calculations		parallel computer algebra	Kühn, Melnikov, Nierste, Steinhauser with Mihaila	
ITHP	QFT, theoretical collider physics, MC generators	Cosmology		Klinkhamer, Mühlleitner, Zeppenfeld with Gieseke	
IKP	hadronic interactions	cosmic rays, Dark Matter, ν physics; Auger, KATRIN, EDELWEISS	CORSIKA, air shower and Dark Matter detectors, KATRIN	Blümer, Drexlin with Engel, Eitel, Haungs, Huege, Keilhauer, Roth, Ulrich	
IPE	CMS	Auger, KATRIN, EDELWEISS	detectors, fast electronics, trigger and data acquisition systems	Weber with Kleifges, Kopmann, Stotzka, Wüstling	
ITEP	red: update Feb 2014	KATRIN, EURECA, XENON	magnets, cryogenics, vacuum, Tritium	Noe, Holzapfel with Bornschein, Day	Electrical Eng. and Information Technology
ITIV			Embedded Electronic Systems	Becker	
IMS			Circuit design, nano-electronics, sensors	Siegel	
ITM, SCC	CMS, Belle	Auger	Tier1-Grid, Cloud, High Performance computing; storage & networks, SIMLABS	Neumair, Streit with Heiss, Kunze, Poghosyan	Informatics
ITTK		KATRIN	Thermodynamics, cryogenics, energy transformation	Grohmann	Chemical and Process Engineering
IPS	Accelerators		Accelerators, synchrotron radiation	Anke-Susanne Müller	Physics

KSETA Institutional Budget

People live in institutes

We define a financial frame (no money flows) total = 131 k€ in 2013

Budget = 2,000 € fixed pedestal + 1,300 € * no.of doctoral researcher
min=3,300 max=48,800 €

Purpose: anything good for the doctoral researchers (appraisal to KSETA)

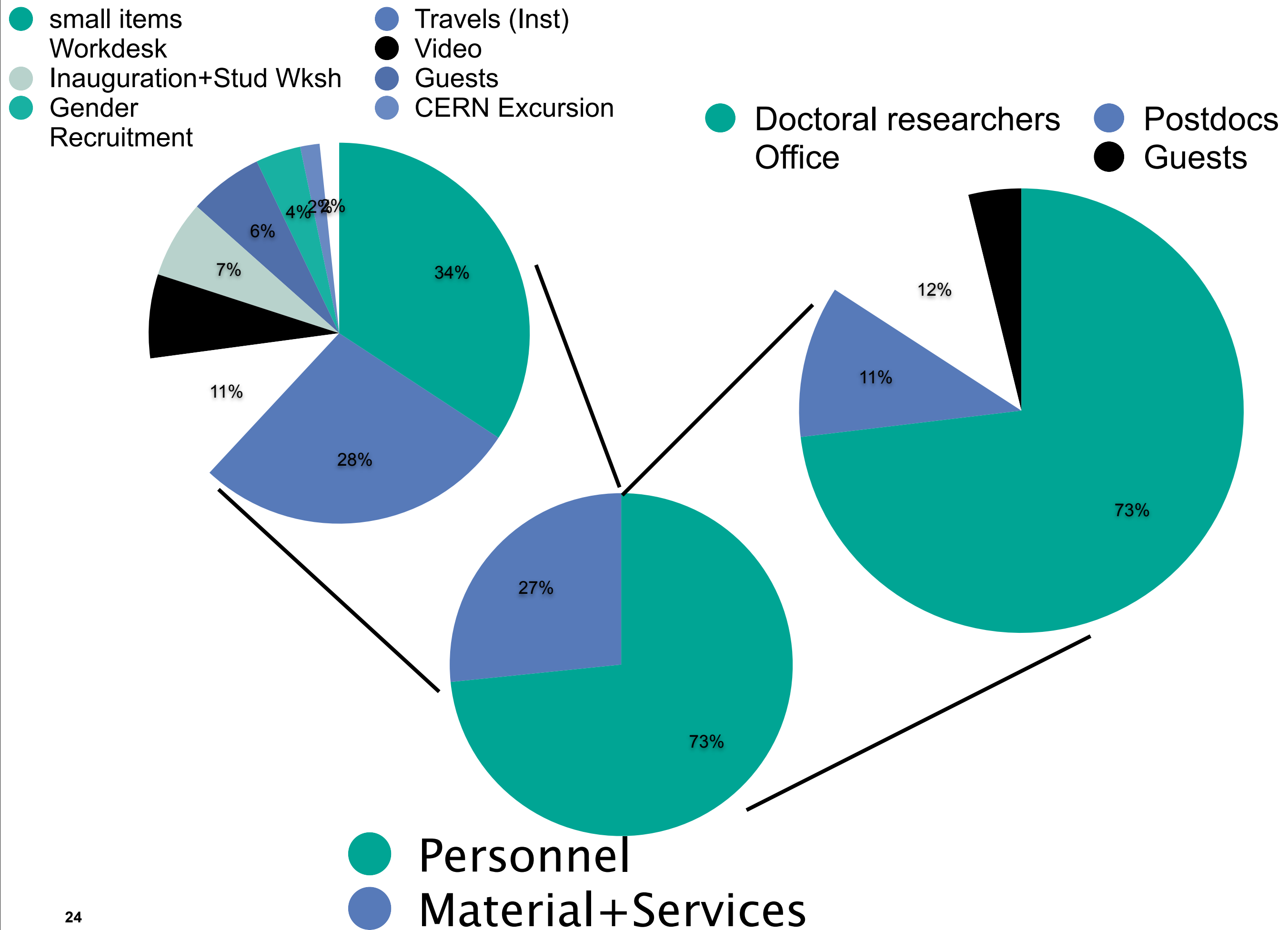
All details left to the Pls, supervisors (complaints to them)

Courses Spring 2013

Elementary particle physics and cosmology for engineers (and others)	F. Klinkhamer (KIT)
Informatics: Big-Data Tools	A. Streit, A. Heiss, D. Ressmann, A. Petzold (all KIT)
Parallel software design for scientists	B. Hegner, T. Hauth, D. Piparo (all CERN)
Electronics for detector builders	M. Weber (KIT)
Monte Carlo Event Generators	S. Gieseke (KIT)
Introduction to astroparticle physics, cosmology and neutrino physics	G. Drexlin (KIT)
Detector technology in direct Dark Matter searches	W. Rau (Ontario, Canada)

Courses Fall 2013

Accelerator based particle physics (for astroparticle physicists)	G. Quast
Parallel programming and graphical processors in scientific applications	G. Poghosyan
Data analysis and statistics for theoretician	R. Barlow
Scientific programming with Mathematics	Th. Hahn
The long journey to the Higgs boson and beyond at the LHC	P. Jenni
Programmable Hardware	D. Göhringer
Collaborative tools for software development	M. Heck
Advanced technology at the LHC of CERN: Higgs boson and more	L. Rossi
Management in enterprises and industry	U. Erdmann



Julius Wess Award



- 2008 Frank Wilczek
- 2009 Jonathan Ellis
- 2010 Valery Rubakov
- 2011 Guido Altarelli
- 2012 Peter Jenni, Michel Della Negra
- 2013 Takaaki Kajita

KSETA Topical Courses Spring 2014

votes = 66

max = 45

Writing the doctoral thesis (better)

min= 6

Kinetic Theory and rarefied gas dynamics (deeper)

Technologische Entwicklung im Experimentierbereich (broader)

[illegible]

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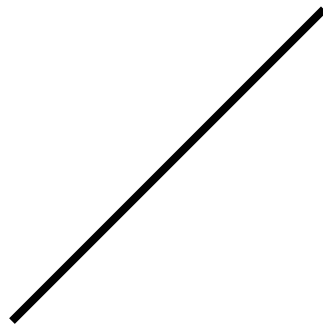
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Black Forest Games

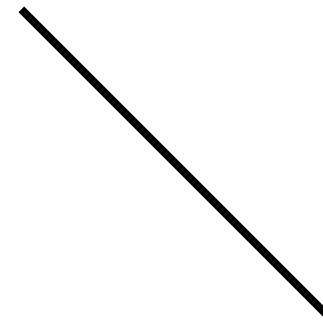
|

dinner in the hotel



meat fondue

cheese fondue



fish

chicken

pasta



