KHuK Strategy Meeting, Bad Honnef, 21+22 Nov 2019

# Report from KAT

Uli Katz, Univ. Erlangen-Nürnberg
KAT Chair
21 Nov 2019

KAT. Komitee für Astro.Teilchen.Physik

# The next 15 minutes

KAT. Komitee für Astro.Teilchen.Physik

- The (new) KAT
- BMBF funding* period 2020-2023
  - Strategy process
  - The new kid on the block: Gravitational Waves
  - Applications and issues
- KAT, NFDI and ErUM-Data
- EPPSU and astroparticle physics
- A few physics highlights

* Verbundforschung
Application deadline was 1 Nov 2019

# The (new) KAT

KAT. Komitee für Astro.Teilchen.Physik

- Election beginning of 2019; thematic constituencies:

| Constituency | Elected | Deputy |
|---|---|---|
| Dark Matter | Manfred Lindner | Federica Petricca |
| Neutrino properties | Kathrin Valerius | Stefan Schönert |
| Low-energy ν astrophysics | Achim Stahl | Michael Wurm |
| Cosmic rays | **Andreas Haungs (Dep.)** | Martin Erdmann |
| Gamma-ray astronomy | Stefan Funk | Jim Hinton |
| High-energy ν astrophysics | **Uli Katz (Chair)** | Elisa Resconi |
| Nuclear astrophysics | Roland Diehl | Camilla Hanson |
| Gravitational waves | Karsten Danzmann | Harald Lück |
| Theory | Thomas Schwetz-Mangold | Martin Pohl |

+ ex-officio members from PT-DESY, BMBF, DFG, DESY, KIT, MPG, DPG, BMBF Review Panel, APPEC, KET, KHuK, RDS, yHEP

See KAT web page www.astroteilchenphysik.de

# BMBF funding 2020-23: Strategy process

- Intensive strategy process in KAT (very tight timeline)
- Strategy paper: Description of the research field and its development

Priority recommendations for ErUM-Pro 2020-2023


KAT. Komitee für Astro.Teilchen.Physik

Astroteilchenphysik in Deutschland –

PERSPEKTIVEN und EMPFEHLUNGEN

Strategiepapier für ErUM-Pro (2020-2023)
Komitee für Astroteilchenphysik

9. Mai 2019

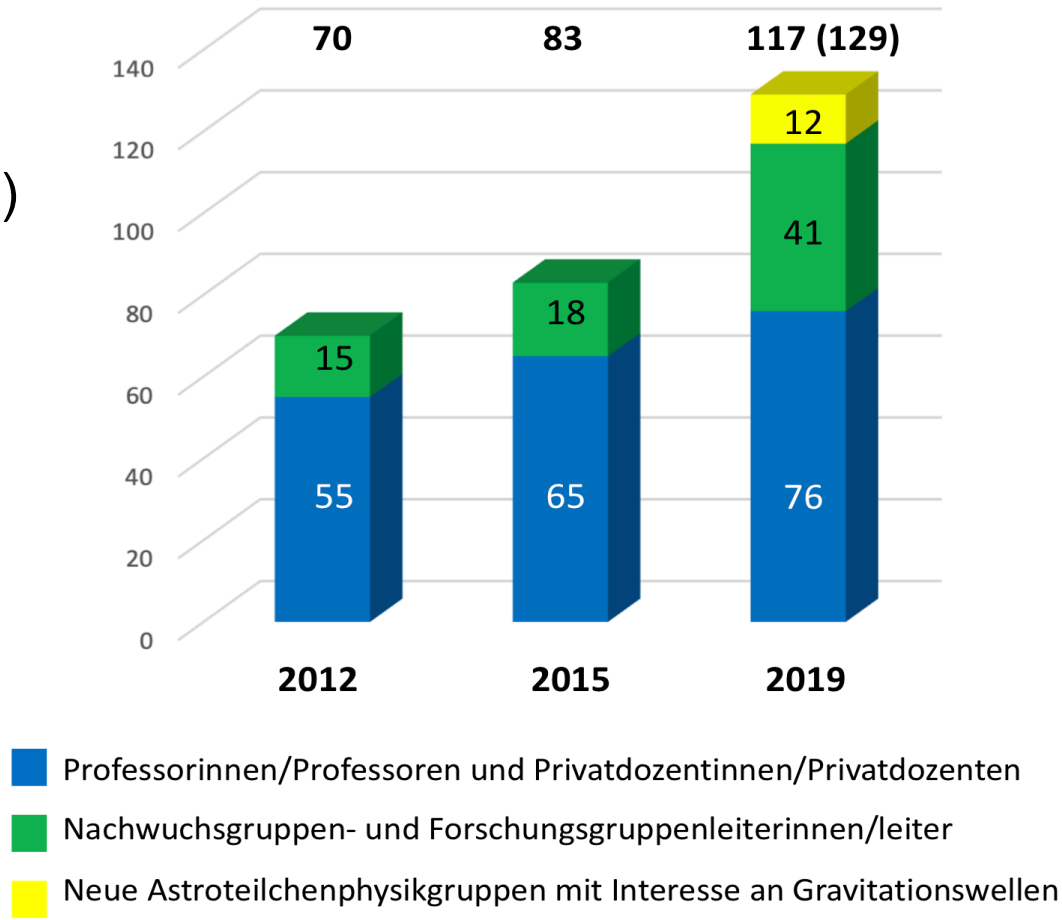
# Astroparticle Physics in Germany 2012-19

KAT. Komitee für Astro.Teilchen.Physik

- Continuous increase in the number of professorships (→ University strategies)
- Over-proportional growth of young researcher groups (→ Attractive field)
- Gravitational waves in ErUM-Pro cause further 10%+X growth

**From the strategy paper:**

**Entwicklung der Astroteilchenphysik in Deutschland**



# BMBF funding 2020-23: Recommendations

KAT. Komitee für Astro.Teilchen.Physik

Projects:

- CTA, IceCube, Pierre Auger (gamma-rays, neutrinos, cosmic rays)
- KATRIN (neutrino mass)
- GERDA → LEGEND (0v2β)
- XENONnT and CRESST-III; preparation of DARWIN (direct dark matter searches)

New:

- Gravitational waves → Einstein Telescope

All included in call

Cross-sectional items:

- Computing & Big Data Science
- Science communication & Outreach
- Networking and coordination structures

Note: Data analysis not BMBF-funded in astroparticle physics

Theory:

- Work in immediate cooperation with experiments

# BMBF funding 2020-23: Gravitational Waves

KAT. Komitee für Astro.Teilchen.Physik

## Situation:

- Gravitational wave experiments only funded through MPG for decades
- Einstein Telescope imminent, one siting option is D/NL/B
- Massive and increasing interest/activities in Germany

## BMBF funding:

- Experimental work towards a next-generation gravitational wave detector explicitly mentioned in call
- Application submitted (rapid community building!)

## Next steps:

- Verbundforschung by far not sufficient to realise ET
- Initiatives at political level
- ESFRI application for ET in preparation
- Possible (coordinating) role of CERN?

# BMBF funding 2020-23: Applications and issues

KAT. Komitee für Astro.Teilchen.Physik

- Applications from astroparticle physics:

| Projects | Cross-sectional applications | | |
|---|---|---|---|
| Auger | Coordination and Communication (includes Outreach) | Multi-messenger astronomy in real-time (includes research data management & astronomy partners) | CORSIKA8 (new setup for CORSIKA air-shower simulations) |
| CTA | | | |
| IceCube | | | |
| Dark Matter | | | |
| 0v2β | | | |
| KATRIN | | | |
| Einstein Telescope | | | |

- Massive oversubscription expected
- Issue: Funding for PhD students – ½ vs. ⅔ positions
  Reminder: Closed system – unless there will be more money, higher salaries imply less positions

# KAT and NFDI

KAT. Komitee für Astro.Teilchen.Physik

Participation in 2 initiatives/proposals:

- PAHN-PaN (with KET, KHuK)
  (focus on particle detection and particle physics aspects)
- Astro@NFDI (with RDS)
  (focus on astronomy/astrophysics aspects)

Evaluation panel
early Nov 2019

Let‘s hope for
good cooperation!

Proposal for a consortium in the DFG's *Nationale Forschungsdaten-Infrastruktur*

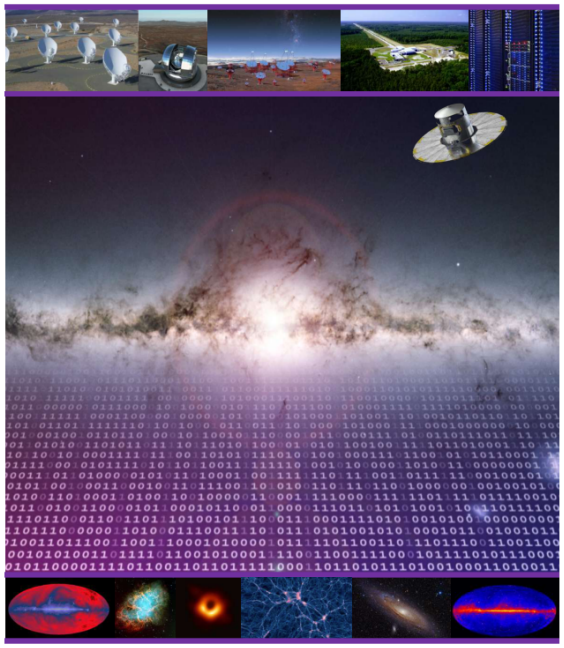
**PAHN-PaN NFDI Consortium Proposal**

The PAHN-PaN Consortium —
Particle, Astroparticle and Hadron & Nuclear Physics Accelerate the NFDI

*Applicant: Deutsches Elektronen-Synchrotron (DESY)*
*Co-applicants:*
*RWTH Aachen University, Universität Bielefeld, Rheinische Friedrich-Wilhelms-Universität Bonn, Technische Universität Darmstadt, Technische Universität Dortmund, Technische Universität Dresden, Friedrich-Alexander-Universität Erlangen-Nürnberg, Frankfurt Institute for Advanced Studies (FIAS), Forschungszentrum Jülich (FZJ), Albert-Ludwigs-Universität Freiburg, Georg-August-Universität Göttingen, GSI Helmholtzzentrum für Schwerionenforschung GmbH, Universität Hamburg, Ruprecht-Karls-Universität Heidelberg, Karlsruher Institut für Technologie (KIT), Universität zu Köln, Johannes Gutenberg-Universität Mainz, Ludwig-Maximilians-Universität München, Westfälische Wilhelms-Universität Münster, Universität Regensburg, Bergische Universität Wuppertal*

*Participants:*
*Ruhr-Universität Bochum, Technische Universität Braunschweig, European Organization for Nuclear Research (CERN), Deutsche Physikalische Gesellschaft, Helmholtz-Zentrum Dresden Rossendorf (HZDR), Johann-Wolfgang-Goethe-Universität Frankfurt, Justus-Liebig-Universität Giessen, Friedrich-Schiller-Universität Jena, Helmholtz-Institut Jena, Max-Planck-Institut für Physik München, Max-Planck-Institut für Kernphysik Heidelberg, Universität Siegen, TIB — Technische Informationsbibliothek (Leibniz Information Centre for Science and Technology), Julius-Maximilians-Universität Würzburg*

**Astro@NFDI**



Astronomy, Astrophysics, and Astro-Particlephysics
within the National Research Data Infrastructure

# KAT and ErUM-Data

KAT. Komitee für Astro.Teilchen.Physik

- … strategic recommendations for the digital transformation in the research field 'Exploration of Universe and Matter' by
  - Komitee für Astroteilchenphysik (KAT)
  - Komitee für Elementarteilchenphysik (KET)
  - Komitee für Beschleunigerphysik (KfB)
  - Komitee für Forschung mit Neutronen (KFN)
  - Komitee für Forschung mit Synchrotronstrahlung (KFS)
  - Komitee für Forschung mit nuklearen Sonden und Ionenstrahlen (KFSI)
  - Komitee für Hadronen- und Kernphysik (KHuK)
  - Rat Deutscher Sternwarten (RDS)

- Currently: Drafting of guidelines ("Leitlinien") for governance

- First money could come 2020 (?)

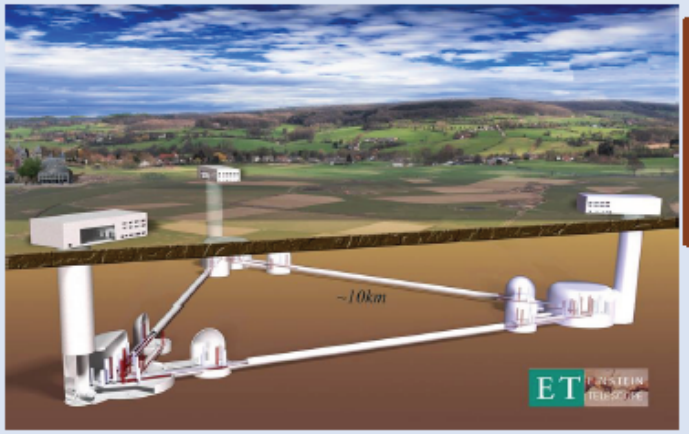
# Astroparticle physics in EPPSU

KAT. Komitee für Astro. Teilchen. Physik

- Many APP contributions to EPPSU Workshop in Granada, May 2019
- Recognised in discussions and reports
- Major question: Role of CERN in Einstein Telescope?

## Astroparticle physics

- Gravitational waves and multimessenger physics open up a new window on the Universe. Very strong physics case.
- There is a very high impact on the field of particle physics (and fundamental interactions) (eg dark matter, neutrinos, general relativity, ...)
- There is clearly an opportunity for the particle physics community and laboratories to expand their involvement in this program



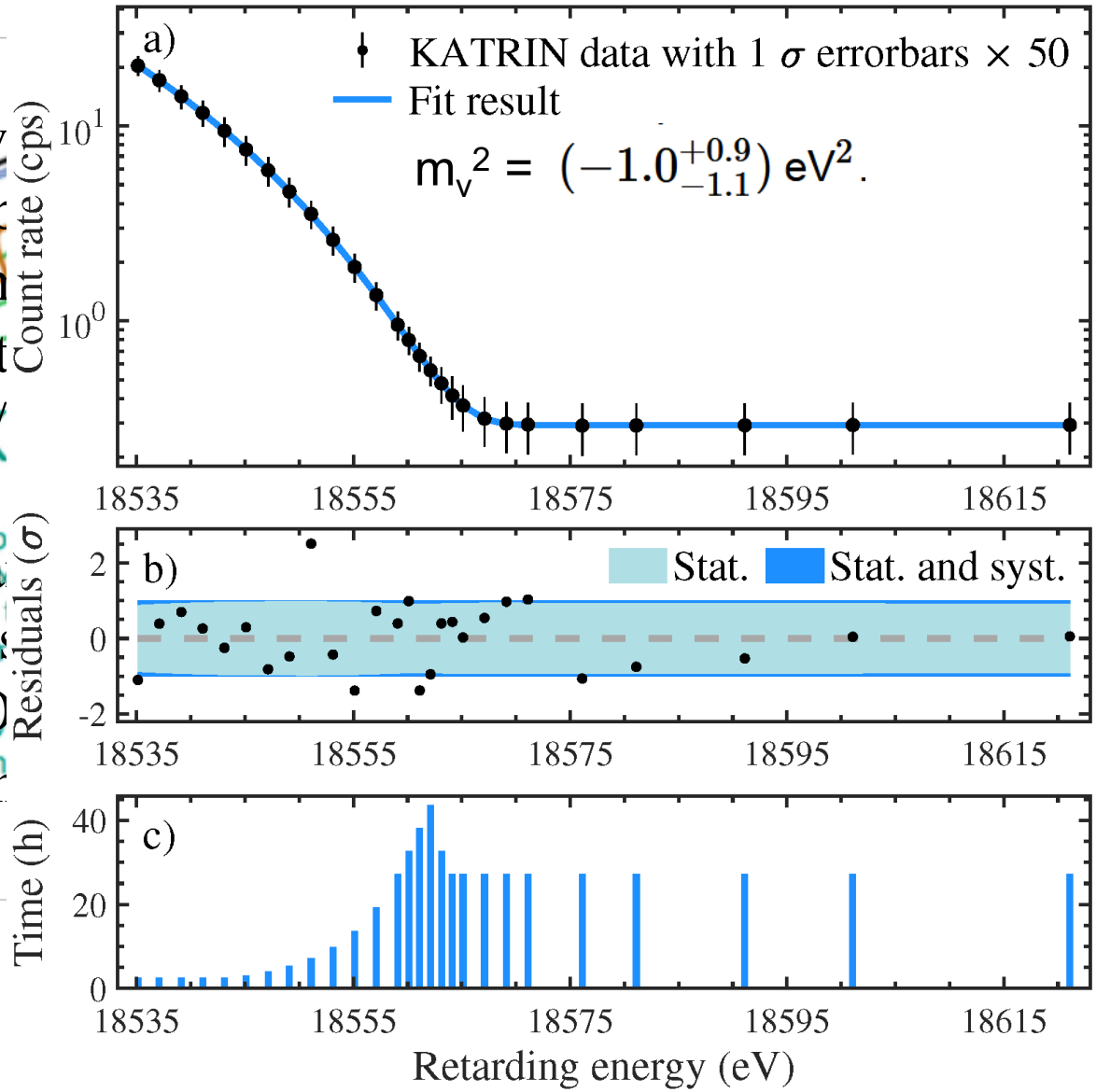

Einstein telescope needs CERN expertise
*"Triangular accelerator without beam"*

**From Halina Abramowicz, Ghent 2019**

# Some physics highlights at the end

KAT. Komitee für Astro.Teilchen.Physik

- First ev 56 (IceCub
- Multi-n with gravitat (LIGO/ .)
- Best da first obs (XENO
- New lir




.katrin.kit.edu