Julius-Maximilians-
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## 2 Postdoctoral and 2 PhD Positions for COSI Software Development in Gamma-ray Astrophysics

The Julius Maximilians University Würzburg and the Johannes Gutenberg University Mainz invite applications for postdoctoral and PhD positions to work on the software development, data analysis and instrument simulations for NASA's new MeV gamma-ray satellite mission COSI, the Compton Spectrometer and Imager, to be launched in 2026.

COSI is a wide field-of-view gamma-ray space telescope that uses cooled germanium detectors to obtain high spectral resolution from 0.2 to 5 MeV. COSI's sensitivity for imaging and spectroscopy is an order of magnitude better than previous telescopes such as INTEGRAL/SPI or the first Compton telescope in space, CGRO/COMPTEL. This leap in sensitivity, coupled with its daily full sky coverage, will revolutionise our understanding of the cycle of creation and destruction of matter in our Galaxy and open this window for further discoveries.

In coordination with the COSI team, Germany will support this mission with a concerted activity on the development of the software for the scientific data analysis. The work packages comprise photon event reconstruction using machine learning techniques, gamma-ray burst and transient localisation, instrumental background simulations using GEANT4 (based on C++) and background modelling, as well as the development of the high-level data analysis framework for end users including image reconstruction and spectral fitting.

We offer a vibrant research environment in high-energy astrophysics and multi-messenger astronomy at Würzburg and in astroparticle physics and dark matter searches at the PRISMA$^+$ excellence cluster at Mainz.

Researchers with a PhD in physics or astronomy, or equivalent qualification, and with relevant experience in high-energy astrophysics or (astro-)particle physics are encouraged to apply for the postdoc positions. Strong Python coding abilities are desired, in particular concerning the handling of large data sets, forward-folding techniques, or Bayesian statistics. A good understanding of particle detectors, detector backgrounds, or detector simulations is advantageous.

For the PhD positions, we search for highly qualified and highly motivated candidates with a keen interest in high-energy astrophysics or astroparticle physics, with an M.Sc. or equivalent degree in physics, astronomy, or a related field. PhD candidates must fulfil the academic requirements of the respective institutions.

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The positions are funded through the German Space Agency (DLR), available starting October 1st, 2022, and will be for the duration of three years (until the launch of COSI).
The salary will be paid at German public service rate (TV-L E13 at 100% for postdocs, and 66% for PhDs). Social benefits are granted according to the regulations for public service, including healthcare, unemployment insurance, and pension funds.

There will be a common application review for both institutions, and applications should be sent as a single PDF in English language to
thomas.siegert@uni-wuerzburg.de by **September 15, 2022.**
Please indicate whether you are applying for both institutions or only for a specific institution.

Postdoc applications should include a motivation letter including a brief (1 page) description of research interests, a CV, a list of publications, and university certificates. Please arrange for two letters of reference to be sent to the same email by the application deadline. The review will begin immediately after that date, but later applications may be considered if received before the selection process is completed.

PhD applications should include a motivation letter, a CV, university certificates, and at least one letter of reference.

For further information about the positions, please contact:
Dr. Thomas Siegert (thomas.siegert@uni-wuerzburg.de) at Würzburg or
Prof. Dr. Uwe Oberlack (oberlack@uni-mainz.de) at Mainz.

The universities of Würzburg and Mainz value equality and diversity in research and encourage women and members of other underrepresented groups to apply. Preference will be given to people with disabilities in case of equivalent qualification.