

Metrology – the science of correct measurement – is an essential cornerstone of our industrialized society. It has an impact on essentially every aspect of our lives, and metrological progress is a key enabler for technical development. Germany's oldest and renowned technical university, TU Braunschweig, and one of the top measurement institutions in the world, Physikalisch-Technische Bundesanstalt, joined forces to establish an international metrological training center – Braunschweig International Graduate School of Metrology (B-IGSM) – to foster metrological knowledge in all areas of science and engineering. Our research fields are in particular Metrology for Society, Industrial Metrology and Fundamentals of Metrology.

The Braunschweig International Graduate School of Metrology together with the Technical Cooperation of PTB offer the opportunity for currently two PhD scholar-ships each year for students engaged in natural sciences or engineering.

To support developing and emerging countries in the field of quality infrastructure the German Federal Ministry for Economic Cooperation and Development (BMZ) provides funding for one

PhD scholarship

for a natural scientist or engineer.

Initially, funding will be granted until 31 October 2026. Given that it typically takes three years to complete a doctoral thesis Prof. Oleksandr Dobrovolskiy will be committed to obtain a follow-up funding. The size of the grant is comparable to grants provided by the German Academic Exchange Service (DAAD). Both scholarships will be located at TU Braunschweig.

To be basically eligible for application you need to be a member of a national metrology institute or a designated institute of a developing or emerging country. Please see full list of partner countries here: <https://www.bmz.de/en/countries>

An excellent academic record and fluent English are prerequisites; skills in the German language are welcome. The submission should include CV, transcripts of the most important documents of professional qualification and a letter of application. B-IGSM promotes the professional equality of women and men and is thus especially interested in applications from women. Disabled persons will be given priority if they have the same occupational aptitude.

Any granting of a scholarship has to be approved by the International Office of TU Braunschweig taking into account the Promotionsordnung (PhD Regulations) of the respective faculty where the scholarship will be located.

Please note that any application needs to be submitted per e-mail to mo.weber@tu-braunschweig.de. Deadline for applications is **30 April 2025**.

Applications are invited for the following topic:

Quantum Hall devices for on-chip magnetic field sensing

The Hall resistance, which is the quotient of Hall voltage and sample current, is known to exhibit quantized steps (Quantum Hall effect) at fractions of the von-Klitzing constant $R_K = h/e^2$, where h is Planck's constant and e the elementary charge. One of the prerequisites for the effect is the existence of a two-dimensional electron gas inside the studied system. On the basis of gallium arsenide one can nowadays produce respective structures e.g. in PTB's clean room facility. This thesis project is concerned with the development of quantum Hall devices for on-chip magnetic field sensing. An extension of the research towards superconductor-based hybrid devices is also possible, depending on the applicant's background.

Applicants should have a master degree in physics or engineering and a basic experience in materials science would be of advantage.

Further information:

Prof. Oleksandr Dobrovolskiy
Cryogenic Quantum Electronics
EMG and LENA, TU Braunschweig
oleksandr.dobrovolskiy@tu-braunschweig.de