Working Group on Information
Arbeitsgruppe Information (AGI)

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Overview of Sessions
(Lecture hall ROT)

Invited Talks of the joint Symposium Quantum Science and more in Ghana and Germany (SYGG)

See SYGG for the full program of the symposium.

SYGG 1.1	Tue	11:00–11:05	WP-HS	**Welcome Adress** — •BIRGIT MÜNCH
SYGG 1.2	Tue	11:05–11:20	WP-HS	**Quantum Education in Ghana** — •DORCAS ATTUABEA ADDO
SYGG 1.3	Tue	11:20–11:45	WP-HS	**Mathematical and Computational Physics Research In Ghana: To Cultivate a Knowledge-Based and Sustainable Development Economy** — •HENRY MARTIN, HENRY ELORM QUARSHIE, MARK PAAL, FRANCIS KOFI AMPONG, ERIC KWABENA KYEH ABAVARE, MATTEO COLANGELI, ALESSANDRA CONTINENZA, JAIME MARIAN
SYGG 1.4	Tue	11:45–12:10	WP-HS	**Forecasting the Economic Health of Ghana Using Quantum-Enhanced Long Short-Term Memory Model** — •PETER NIMBE, HENRY MARTIN, DORCAS ATTUABEA ADDO, NICODEMUS SONGOSE AWARAYI
SYGG 1.5	Tue	12:10–12:40	WP-HS	**Quantum Technology with Spins** — •JOERG WRACHTRUP
SYGG 1.6	Tue	12:40–13:00	WP-HS	**Renewable Energy Technologies for Rural Ghana: The Role of Appropriate Technology for Tailored solutions** — •MICHAEL KWEKU EDEM DONKOR

Prize and Invited Talks of the joint Awards Symposium (SYAS)

See SYAS for the full program of the symposium.

SYAS 1.1	Thu	14:30–15:10	HS 1+2	**A journey in mathematical quantum physics** — •REINHARD F. WERNER
SYAS 1.2	Thu	15:10–15:50	HS 1+2	**Precision Tests of the Standard Model at Low Energies Using Stored Exotic Ions in Penning Traps** — •KLAUS BLAUM
SYAS 1.3	Thu	15:50–16:30	HS 1+2	**Controlling light by atoms and atoms by light: from dark-state polaritons to many-body spin physics** — •MICHAEL FLEISCHHAUER
SYAS 1.4	Thu	16:30–16:35	HS 1+2	**Quantum history at your fingertips: Launch of the DPG's Quantum History Wall** — •ARNE SCHIRRMACHER

Sessions

AGI 1.1–1.2	Wed	11:00–12:30	HS ROT	**Hacky Hour (joint session AGI/AKjDPG)**

AGI 1: Hacky Hour (joint session AGI/AKjDPG)

In this new format, introduced by AGI and jDPG, tools are presented that can be helpful in your everyday scientific work. Whenever possible a hands-on part will be offered where the tool can be used directly preferably on your own laptop. Furthermore there will be a discussion of the tool where e.g. aspects of compatibility and extensibility can be addressed.

If installation of software is necessary in advance instructions on this and further information in general can be found at https://hacky-hour.dpg-physik.de

Time: Wednesday 11:00–12:30   Location: HS ROT

AGI 1.1   Wed 11:00   HS ROT

DFT Tone-extraction made easy: A toolbox to extract all important parameters from a Fourier-Transformed Time-Series — •Timon Damböck and Ilja Gerhardt — light and matter group, Institute for Solid State Physics, Leibniz University of Hannover, Appelstrasse 2, 30167 Hannover

When measuring with a quantum sensor, e.g. a magnetometer, the sensing information is contained in a time–series. The parameters of this 'tone'–response from the sensor is limited to the response of it in the measurement bandwidth. While those parameters can be obtained via a fit in the time–domain, this extraction is both slow and prone to systematical errors due to mis– or overestimation of those parameter. To circumvent this, a Discrete–Fourier–Transform (DFT) is used for the extraction of the parameters. It reveals the amplitude and the noise content in a specific bandwidth – if done correctly. Although conventional fitting methods can be used to reconstruct the amplitude and frequency below their internal resolution in the frequency domain, the use of wrong response functions in frequency space can lead to biases when comparing results with others. To overcome all this, we implemented a toolbox, which relies on estimating the parameters solely from the transformation into frequency domain – without the need for fitting. Hereby we aim to reduce the influence of systematical errors, while being fast and resource–efficient enough to assure real–time extraction and tracking of parameters in the lab.

AGI 1.2   Wed 11:45   HS ROT

Set up a quantum simulation from a screenshot — •Gregory Varghese Manalumbhagath — HQS Quantum Simulations

Setting up quantum simulation is often a daunting task, fraught with intricate parameter configurations and strict adherence to tool-specific conventions. To alleviate this challenge, the HQS Modeling Assistant provides an efficient way of generating requisite inputs, guiding users through module functionalities and assisting in the creation of simulation inputs through the simple and yet familiar interface of chat.

The assistant can perform simulations, as well as analyse results by generating plots and reformatting into tables. The assistant can process structured and unstructured data like figures of quantum circuits, scientific equations, scientific texts from scientific papers thereby reducing the cognitive load on researchers. In this talk, the users will learn how to setup and run a quantum computing simulation by merely uploading a screenshot of equation or image of circuit or just chatting with the HQS Modeling Assistant. This way the focus is shifted from the technical implementation of the scientific paper to the underlying concepts and insights.