HOLO

Newsletter No 1

Dear Readers,

Welcome to the first issue of the HOLO project newsletter which aims to provide you with the recent news and events regarding the different activities and scientific achievements of the consortium partners.

The aim of the HOLO project is to boost the scientific excellence and innovation capacity in digital holographic microscopy of the Institute of Applied Physics of the Academy of Sciences of Moldova (IAP-ASM) by creating a network with the high-quality Twinning partners: Universität Stuttgart (USTUTT), Tampere University of Technology (TUT) and Intelligentsia Consultants.

To achieve this aim, the partners will implement a science and innovation strategy focused on two sub-topics:

- Design and optimization of diffractive optical elements (DOE) to improve digital holographic microscopy (DHM)
- Development of advanced image processing algorithms for digital holographic microscopy (DHM) using diffractive optical elements (DOE)

Over the course of three years, the consortium partners will collaborate in numerous knowledge-transfer activities. These include international conferences and training workshops where everybody including students are encouraged to participate, several staff exchanges and three summer schools which will be held in each of the partners facilities.

TAMPERE UNIVERSITY OF TECHNOLOGY

Universität Stuttgart

intelligentsia consultants

We hope that you enjoy your reading and continue to stay updated with the upcoming newsletters by subscribing to our website H2020-HOLO.

European Commission

The HOLO project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 687328

Kick-off meeting

The HOLO kick-off meeting took place in Chisinau (Moldova) the 27th of January 2016. The project launch was hosted by the coordinator, the Institute of Applied Physics of the Academy of Sciences of Moldova. The meeting started with the introduction of the partners and their institutions, followed by the presentation of the project and a discussion on the working plan for the first semester. It was decided to organize the first project summer school and workshop on technology transfer and innovation management in mid-September 2016 in conjunction with the international conference which will be held in Chisinau at the same time. Moreover, a press conference with journalists from local mass media, including TV channel MOLDOVA1 and radio station MOLDOVA was held at the beginning of the meeting.

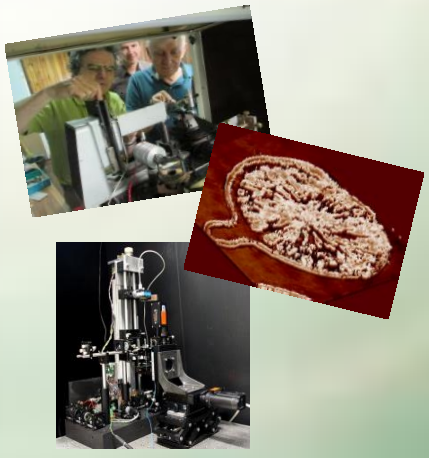
Core activities of the project

- Staff exchanges Moldova-Germany & Moldova-Finland
- Trainings
- Workshops
- Summer schools
- International conferences
- Outreach activities

About the coordinator

The Institute of Applied Physics of ASM (IAP-ASM) has the following priorities: the fundamental and applied investigations in physics of condensed matter: crystalline, non-crystalline and nanostructured materials, electronics and quantum optics, design of high technologies and multifunctional electronic, optoelectronic and photonic devices. The research profile of the Recording Media and Photonics Laboratory is "Physics and engineering of non-crystalline materials, photonic and optoelectronic devices". The lab team carries out the study of optoelectronics and optical sensors, holography, holographic interferometry, new phenomena concerning photo-induced absorption, photoluminescence and light amplification in chalcogenide glasses and polymers, as well as elaboration of registration media and holographic information technologies.

Staff exchanges



IAP-ASM → USTUTT

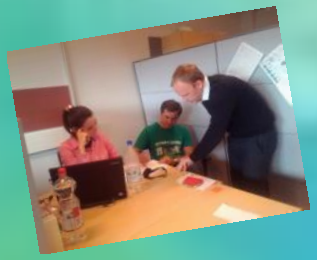
The first staff exchange between IAP-ASM and Universität Stuttgart (USTUTT) took place from March 7th until April 2nd 2016. Dr. Elena Achimova and Dr. Vladimir Abaskin assisted colleagues in Germany with topological observations of surface relief grating which were made using a bright-field holographic microscope. During this visit, the optical scheme for the recording of diffractive optical elements (DOE) using SLM was designed and a presentation was submitted to the Imaging and Applied Optics Congress scheduled to take place on the 25th-28th of July 2016 in Heidelberg, Germany.

On June 6th 2016 another staff exchange of the HOLO project took place, with Professor Giancarlo Pedrini from USTUTT (Germany) traveling to Moldova for 3 weeks. While in Moldova, Prof. Pedrini worked with Moldovan colleagues on research in the design and optimization of DOE to improve DHM. From the 27th of June until the 23rd of July, IAP-ASM's researcher Alexei Mesalchin and master student Veronica Cazac visited USTUTT, where together with the Prof. Pedrini's group they designed and assembled the optical scheme for the recording of DOE using SLM.

During the 3rd -29th of October 2016, Dr. Achimova and Dr. Abaskin assisted colleagues of USTUTT with the design and assembly of the optical scheme for the recording of DOE using SLM. Using this optical scheme, surface relief elements as phase singularity gratings were recorded on nanomultilayer structures (NML).

IAP-ASM → TUT

Dr. Achimova and Dr. Abaskin visited the Tampere University of Technology (TUT) in Finland from the 18th of April until the 14th of May. During this visit, Sparse Phase and Amplitude Reconstruction (SPAR) techniques were studied. An article titled "Noise minimized high resolution digital holographic microscopy applied to surface topography" was produced and has been prepared for publication.



From July 23rd until August 20th, IAP-ASM scientific researcher Alexei Mesalchin and master student Veronica Cazac together with the Finnish group leader Prof. Vladimir Katkovnik and Dr. Igor Shevkunov simulated the process of digital holographic recording and made computer phase reconstruction by local least square method using Matlab software. It was shown that the application of phase grating during the hologram recording led to a considerable phase imaging enhancement (about 20% of PSNR).

As a result of the intensive collaboration and stuff exchange between Moldova and Finland, Moldavian participants gained new skills in signal processing and Matlab programing of holograms phase reconstruction. The obtained results have been presented at the international conferences in Moldova, Chisinau "Health technology management" on 6th-8th October 2016 and Ukraine, Kiev "International Young Scientist Conference-SPO 2016" on 27th-30th October 2016.

First summer school in Chisinau, Moldova

The HOLO team is happy to announce that the first Summer School organized within the framework of the H2020 HOLO project was held during the 12th-16th of September 2016 in Chisinau, Moldova.

The summer school was organized in conjunction with the 8th International Conference on Materials Science and Condensed Matter Physics, which IAP-ASM (the project coordinator) organizes biennially.

The event started with a workshop dedicated to EU funding opportunities and proposals organized by one of the HOLO partners, Intelligentsia Consultants (Luxembourg). During the week, after the morning plenary sessions, the participants attended lectures of the Summer School dedicated to Digital and Optical Holography.

The participants highly appreciated the organization of the event. More than 100 people attended the MSCMP conference. The next HOLO summer school will be held in Stuttgart, Germany, in June 2017.

Upcoming events and activities

The HOLO team is pleased to announce that the second summer school will take place in Stuttgart, Germany in June 2017. Further staff exchanges will also continue to happen in the following months.

To learn more about the HOLO project activities and achievements, please visit our website

www.h2020-holo.com

Register now to our mailing list and receive the HOLO newsletters as soon as they are released.

Contact
HOLO Project Coordinator
Dr. Elena Achimova
achimova@phys.asm.md

Institute of Applied Physics
5 Academiei str.
Chisinau, MD-2028
Moldova