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December 2016

H2020 HOLO Newsletter #1

Dear Reader,

Welcome to the 1st issue of the H2020 HOLO project newsletter!

In this newsletter you will find an overview of the project, events organised over the course of the first year of the project, as well as the scientific achievements of the consortium partners.

We wish you a pleasant reading!

H2020 HOLO Team

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ABOUT THE H2020 HOLO PROJECT

The overall 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 (Intelligentsia). To achieve this aim, the 3 year project will build upon the existing strong research and innovation base of IAP-ASM and its Twinning partners.

To boost their scientific excellence and innovation capacity in digital holographic microscopy, the partners will implement a science and innovation strategy focused on two sub-topics:

1. Design and optimization of diffractive optical elements (DOE) to improve digital holographic microscopy (DHM), and

2. Development of advanced image processing algorithms for digital holographic microscopy (DHM) using diffractive optical elements (DOE)

Core activities of the project:
- Staff exchanges Moldova - Germany and Moldova - Finland;
- Trainings;
- Workshops;
- Summer schools;
- International conferences;
- Outreach activities.

Consortium Partners:

Coordinator:
Institute for Applied Physics of Academy of Sciences of Moldova

Universität Stuttgart, Germany

TAMPERE UNIVERSITY OF TECHNOLOGY

Intelligentsia Consultants, Luxembourg

HOLO KICK-OFF MEETING IN CHISINAU, MOLDOVA

On 27 January 2016 the H2020 HOLO project has been officially started in Chisinau, Moldova.

The project kick-off meeting was hosted by the coordinator, the Institute of Applied Physics of the Academy of Sciences of Moldova.

The meeting started with presentations of the project and its consortium partners, followed by discussion of the working plan for the first semester.

The partners have decided to organise 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 that time.

Moreover, a press conference with journalists from local mass media, including TV channel MOLDOVA1 and radio station MOLDOVA, was organised at the beginning of the meeting.

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 noncrystalline materials, photonic and optoelectronic devices". 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.

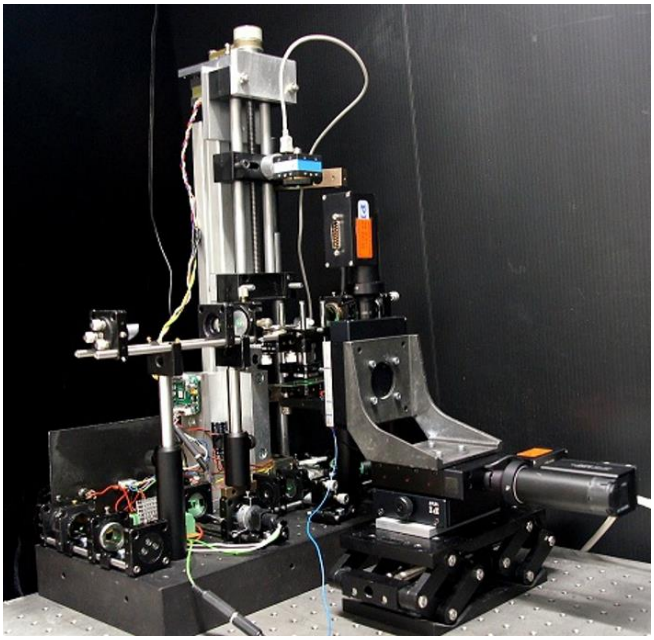
FIRST STAFF EXCHANGES BETWEEN MOLDOVA AND GERMANY

From 7th March until 2nd April 2016, the first staff exchange between IAP-ASM and Universität Stuttgart (USTUTT) took place. Dr. E. Achimova and Dr. V. 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 submitted to the Imaging and Applied Optics Congress taking place 25th-28th July 2016 in Heidelberg, Germany.

On 6th June 2016 another staff exchange of the HOLO project took place, with Professor Pedrini from USTUTT (Germany) traveling to Moldova for 3 weeks. While in Moldova, Prof. Pedrini was working with Moldovan colleagues on research in the design and optimization of DOE to improve DHM.

From 27 June until 23 July, IAP-ASM's researcher A. Mesalchin and master student V. 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 3-29 October 2016, Dr. E. Achimova and Dr. V. Abaskin assisted colleagues of USTUTT with design and assemble 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).



FIRST STAFF EXCHANGES BETWEEN MOLDOVA AND FINLAND

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

From 23th July until 20th August, 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 have made computer phase reconstruction by local least square method using Matlab software. It was shown that application of phase grating during the hologram recording let 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 06-08 October 2016 and Ukraine, Kiev “International Young Scientist Conference-SPO 2016” on 27-30 October 2016.

SUMMER SCHOOL IN CHISINAU, MOLDOVA

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

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

The event started with a workshop dedicated to EU funding opportunities and proposal preparation organised 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 organisation 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.

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