

## Newsletter No. 3: Sept 2021 - Aug 2022

### **MaNaCa in a nutshell**

The MaNaCa project aims to develop the scientific and technological capacity as well as raise the research profile of the Institute for Physical Research of the National Academy of Sciences (IPR-NAS) in Armenia. From a scientific standpoint, MaNaCa will focus on the structural and magnetic characterization of magnetic nanohybrids and their application for cancer therapy. The project's aim will be accomplished by networking IPR-NAS with two internationally-leading research organisations: the Aristotle University of Thessaloniki (AUTH) in Greece and the University of Duisburg – Essen (UDE) in Germany. Throughout the project, the research partners will be supported with the management and dissemination activities by Intelligentsia Consultants Sàrl (INT), a consultancy company based in Luxembourg, which has already collaborated on several occasions with IPR-NAS during the FP7 and H2020 programmes.

From 2019-2023, the partners will carry out a research and innovation strategy with the following objectives:

1. Stimulate scientific excellence and innovation capacity of IPR-NAS with regard to magnetic nanohybrids for cancer therapy.
2. Improve the career prospects of early stage researchers of IPR-NAS and the Twinning partners
3. Raise the research profile of IPR-NAS and the Twinning Partners

These objectives will be centred around a research and innovation strategy focused on two sub-topics:

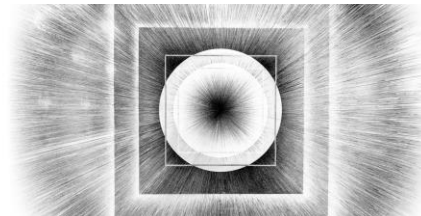
- A. Structural and magnetic characterization of nanohybrids
- B. Magnetic particle hyperthermia

In order to accomplish this, the consortium partners will implement a comprehensive set of actions:

- Exchange of senior researchers;
- Exchange of early stage researchers; and
- Dissemination and outreach.

In addition to staff exchanges, the project activities will also include technical training, joint publications, joint participation to conferences, organization of summer schools, workshops and an international conference.

[www.h2020-manaca.eu](http://www.h2020-manaca.eu)



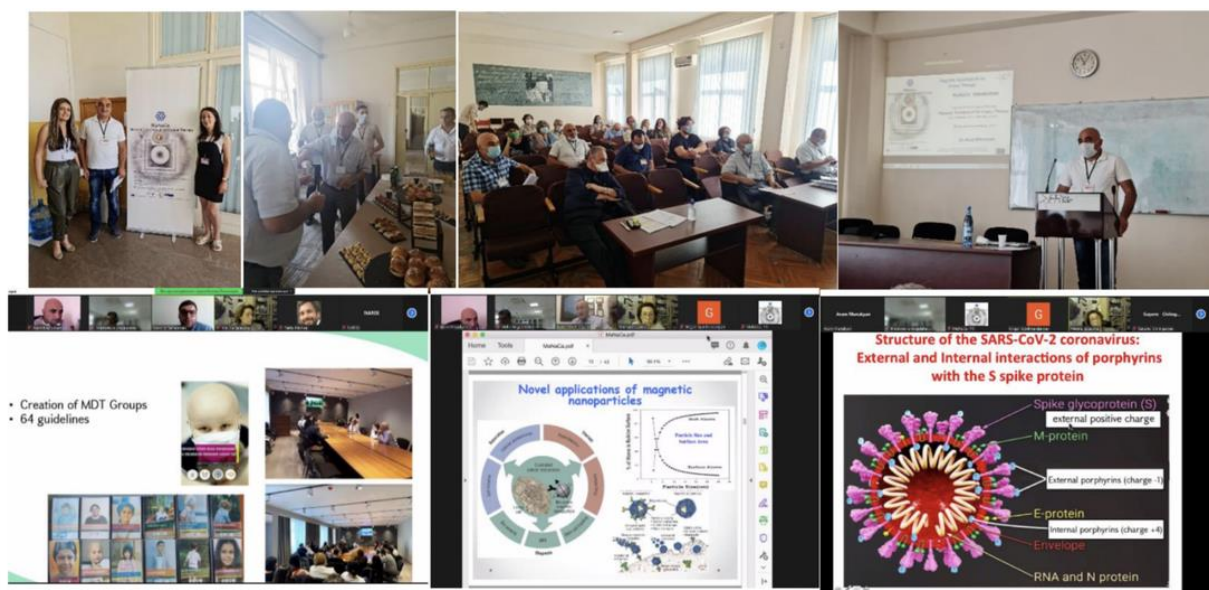

## News

### September 2021, 4th Training workshop "Magnetic Nanohybrids for Cancer Therapy"

On 21-22 September, 2021, the 4th MaNaCa Training Workshop on Magnetic Nanohybrids for Cancer Therapy was held. On the first day, a joint session of the MaNaCa and the "Laser Physics-2021" international conference organized by IPR-NAS, took place in Ashtarak, as a hybrid event. On the second day, the MaNaCa own workshop has been conducted by Zoom/online.

The Training Workshop was focused on the functional magnetic nanoparticles synthesis, their complex structural and magnetic investigations and application in cancer therapy. The researchers from the MaNaCa consortium partners were also informed about various cancer treatment methods. A special feature of the training workshop was the participation of a number of Armenian groups engaged in the field of cancer therapy.

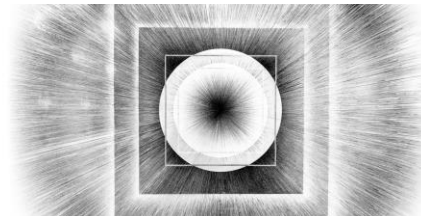
Additionally, the opportunities of Horizon Europe Twinning call were presented by the Head of International S&T Programmes Department of The National Academy of Sciences of RA, Tigran Arzumanyan. 89 people from 10 countries attended the "MaNaCa meets Laser Physics" event.



### International Conferences attended during Year 2

In 2021 the MaNaCa team attended conferences to disseminate scientific results and promote IPR-NAS research team:

- [84th Annual Meeting of the German Physical Society \(GPS\) and GPS Meeting of the Condensed Matter Section](#), Berlin, Germany, 27.09.-01.10.2021. Presentation "Structure and magnetism of Fe/Fe<sub>3</sub>C/Carbon nanocomposites: Influence of the pyrolysis conditions" made by Elisavet Papadopoulou
- [XXXV Panhellenic Conference on Solid State Physics and Materials Science](#), 26-29 September 2021, Athens, Greece. Presentation of research paper "Fe/Fe<sub>3</sub>C magnetic nanohybrids: Synthesis, features and applications" made by M. Tsoimpanoglou, A. Makridis



## News (continued)

### International Conferences attended during Year 2 (continued)

- [APS March Meeting 2021](#), March 15–19, 2021; Virtual. Presentation of research paper "Structure and Magnetism of Fe/Fe<sub>3</sub>C Nanoparticles in Carbon Spheres", authors H. Gyulasaryan, E. Papadopoulou, N. Tetos, G. Chilingaryan, M. Spasova, M. Farle, A. Manukyan, E. Myrovali, M. Angelakeris, K. Castillo, O. Bernal, A. Kocharian
- [2021 Around-the-Clock Around-the-Globe Magnetism Conference \(AtC-AtG\)](#), August 24, 2021, Virtual. Presentation of research paper "Synthesis, Structure, Magnetism and Magnetic Particle Heating Characterization of Fe/Fe<sub>3</sub>C Nanoparticles in Carbon Matrix, H. Gyulasaryan, N. Sisakyan, G. Chilingaryan, A. Manukyan, A. Makridis
- 6th international advanced school "Frontiers in Optics & Photonics" 30 August – 11 September, 2021, Yerevan-Ashtarak, Armenia. Presentation of research paper "Synthesis and Characterization of Fe/Fe<sub>3</sub>C Nanoparticles in Carbon Matrix for Magnetic Hyperthermia of Cancer Cells", H. Gyulasaryan, N. Sisakyan, G. Chilingaryan, A. Manukyan



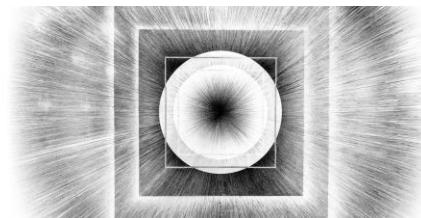
### April 2022, MaNaCa Training Workshop

The MaNaCa training Workshop on Magnetic Nanohybrids for Cancer Therapy was held on 7-9 April 2022 in Thessaloniki, Greece.

The workshop was focused on structural and magnetic characterization of magnetic nanohybrids and their application for cancer therapy. Aiming to establish a tradition, this workshop provided training in the basic principles of nanomagnetism and its biomedical applicability through a broad series of fundamental lectures, while offering the latest insights into up-to-date aspects of magnetically driven cancer therapies.

The workshop was addressed to graduate and PhD students, as well as to post-doc and young researchers working on the field of magnetic nanomaterials focusing on their biomedical applicability.





## News (continued)

### May 2022, IPR-NAS Early-Stage Researchers Visit Aristotle University of Thessaloniki

IPR-NAS early-stage researchers Gayane Chilingaryan, Harutyun Gyulasaryan and Vardges Avagyan visited twinning partner Aristotle University of Thessaloniki since early April. During their visit, the Armenian students received lab courses covering Magnetic Nanoparticle Synthesis, Sample Preparation, X-ray diffraction (XRD), X-ray photoemission spectroscopy (XPS), Atomic Absorption Spectroscopy (AAS), Vibrating Sample Magnetometry (VSM), Magnetic Particle Hyperthermia (MPH) and Magnetic Simulation. Also, they learnt to conduct experiments, collect experimental data and perform statistical and graphical analysis to illustrate the correlation between their data.



### July 2022, Results of Master Student's Visit to AUTH

University of Duisburg-Essen's Master student Elisavet Papadoupoulou spent three-months visiting Aristotle University of Thessaloniki in late 2021 as part of the MaNaCa project's training activities. During her visit she was trained to measure X-ray photoemission spectroscopy (XPS), Atomic Absorption Spectroscopy (AAS), Vibrating Sample Magnetometry (VSM), Magnetic Particle Hyperthermia (MPH) and to process the data. She recently presented the scientific results of her training work during a MaNaCa online seminar held on 26 June 2022.



## Contact

**Dr. Aram Manukyan**  
(Project Coordinator)

Institute for Physical Research,  
National Academy of Sciences of Armenia,  
Ashtarak-2, 0203,  
Republic of Armenia  
[manukyan.ipr@gmail.com](mailto:manukyan.ipr@gmail.com)