



Fall in IUT Campus in October

IUT International E-Newsletter

A Window to International Activities of IUT

Volume 4, Issue No. 1

October 2022



What we read in this issue:

- IUT International News
- IUT News on Industry & Technology on:
- Promotion of the Technological Laboratories of IUT
- Application of Electron Back Scatter Diffraction (EBSD) technique to reveal patterns in various industrial and academic samples at IUT
- In the National Laboratory Network for Strategic Technologies, the Iranian National Observatory Has Recorded the First Light Image of its 3.4m Optical Telescope



IUT in “Times Institute of Higher Education” Ranking for 2023



According to the largest global ranking institute of universities i.e. "Times Institute of Higher Education" for 2023, more than 2500 universities from 104 countries of the world were assessed. After the initial evaluation, the number of 1799 universities met the necessary conditions to participate in this ranking. According to the list published by this ranking institute, **Oxford, Harvard, and Cambridge** were the first to third universities world-wide.

Participation of Iranian universities in this ranking has been on the rise, so that the number is 58 in 2022, while it is 65 in 2023. Two Iranian universities are mentioned as "reporter". Institutions whose world rankings are stated as "reporter" are the ones that have provided their data to "Times Higher Education Institute", but did not meet the minimum requirements to obtain the world ranking.

In this ranking, **Isfahan University of Technology (IUT)** was ranked 33rd nationally (among all comprehensive universities, technological, and medical sciences) and was ranked 1001-1200 globally.

IUT in “THE” World University Rankings by Subject - 2023

On 25 October 2022, Isfahan University of Technology was ranked in the 2023 Times Higher Education World University Rankings by **Subject**.

The below list shows a comprehensive summary of Isfahan University of Technology's performance in all 4 subject rankings:



Subjects	Global Rank
Computer Science:	501–600
Engineering:	601–800
Life Sciences:	601–800
Physical Sciences:	601–800

It should be mentioned that IUT is not applicable in 6 subjects such as Law, Art & Humanities, Business and Economics, Clinical and Health, Education, Psychology and Social Sciences. It means that IUT did not select these subjects whilst completing the World University Rankings data collection procedure.

Directors of ANKA Student Company Paid a Visit to Isfahan University of Technology (IUT)



The International Scientific Cooperation Center of Isfahan University of Technology hosted ANKA Student company directors from **Turkey** on October 22, 2022. In this meeting, **Messrs. Tamer Güngör** and **Ozan Güngör** introduced this company and talked about the opportunities for international scientific cooperation and also future possible programs.



From Right to Left: Mr. Bqeri, Mr. Tamer Güngör , Prof. Mosaddegh, Mr. Ozan Güngör and Mr. Bahrami

Prof. Peiman Mosaddegh, Director of the International Scientific Cooperation Center of Isfahan University of Technology, welcomed the expansion of cooperation between IUT and this company and added that the signing of a memorandum of understanding between the two institutions paves the way for more scientific cooperation in various areas like education, research and internship courses.

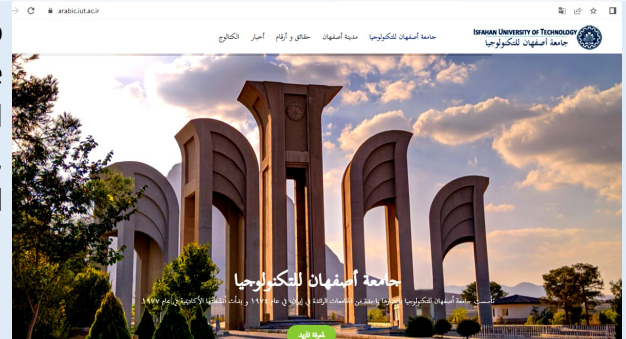
The parties of this meeting discussed the possibility of expanding the communication and cooperation between the top universities of Isfahan province and Turkey through the consortium of Isfahan Universities Network (IUN). This expansion will be in line with the strategic development program of Isfahan University of Technology under the goal of internationalization of the university and in areas of exchanging professors and student, and having international joint scientific programs.

It should be mentioned that ANKA Student Company, located in Ankara, is the representative of some prestigious universities in Turkey, which promotes for the universities of this country through various activities such as holding exhibitions, and providing free advice to students on international academic programs.

The Website of Isfahan University of Technology is Designed and Run in Arabic

Associated with the strategic development plan of IUT and to step forward to meet the internationalization goals of the university, and to provide easier access for international students and applicants at Isfahan University of Technology, International Scientific Cooperation Center of IUT has launched the website of this university in Arabic language.

You can visit the website on <https://arabic.iut.ac.ir>



IUT Webinars

IUT Department of Civil Engineering organized a specialized webinar on "Vibration Control of Structures through Vibrating Barriers" on October 3rd, 2022.

Dr. Pierfrancesco Cacciola from the University of Brighton, England, presented a lecture at this webinar. Dr. Cacciola is a reader at school of Architecture, Technology and Engineering at University of Brighton. He is research group leader of Sustainability and Resilience Engineering (SuRE). He received his PhD in Structural Engineering from the University of Catania, **Italy**.

Prof. Nasimifar, A faculty member of the Department of Civil Engineering at IUT, was the coordinator and host of this event.



Dr. P. Cacciola

The Fifth Lecture from the IUT Series of Interdisciplinary Lectures

The Fifth Lecture from the Series of Interdisciplinary Lectures of IUT on "Air Pollution, Sources and Factors, Challenges and Solutions" was presented by **Prof. Mohsen Soleimani**, a faculty member of the Department of Natural Resources Engineering at Isfahan University of Technology, on October 27th. This lecture was delivered online too.

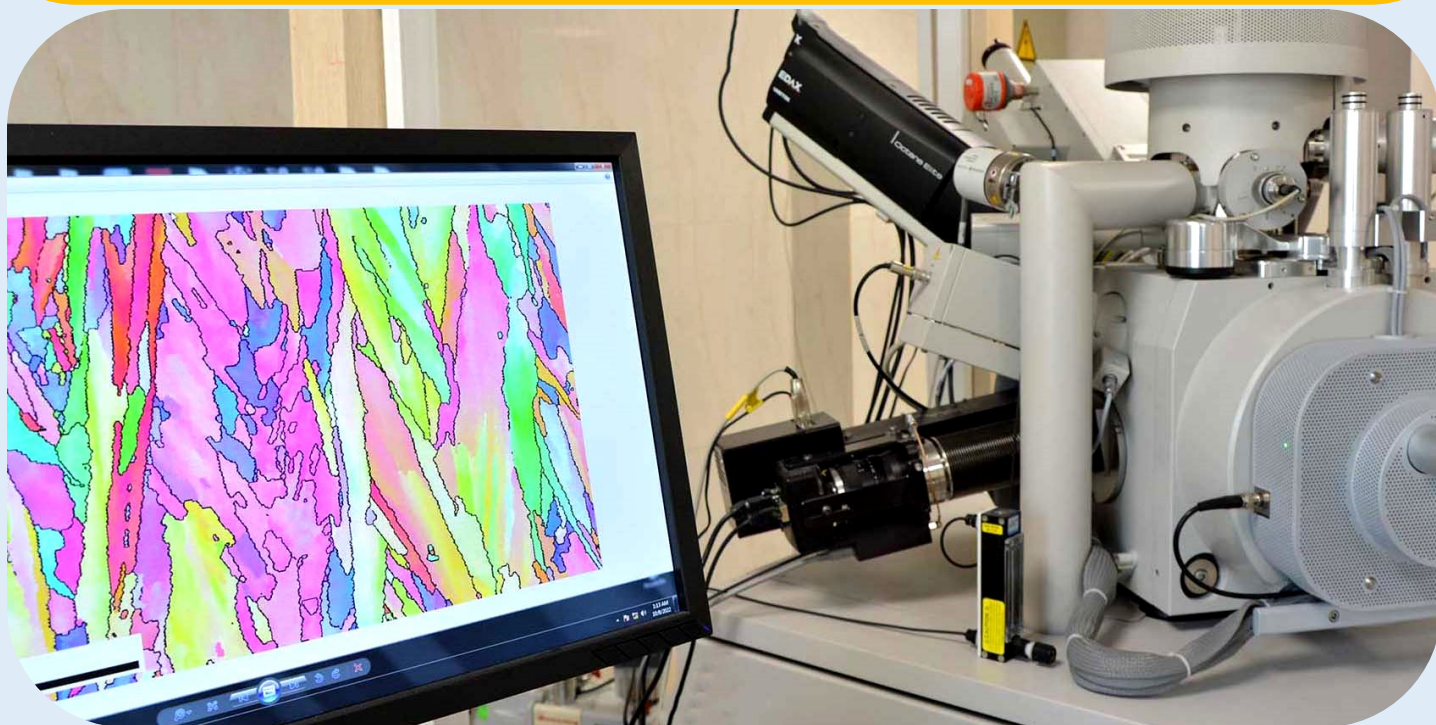
In this meeting, he gave a presentation on the sources and factors that cause air pollution based on the results of case studies in the country and the world. In this scientific meeting, the deputy for research of the Department of Natural Resources Engineering discussed the role of various sciences to better understand the problem and presented control solutions to reduce pollution.

Air pollution is one of the most important environmental problems of big cities in the world which has negative health, social, and economic effects. Unsustainable development especially in developing countries and lack of attention to the environmental capacity, various industrial activities, transportation, consumption of fossil fuels, desertification, the phenomenon of dust (haze), climatic and topographical conditions in the different regions, including big cities of the country such as Isfahan, have led to the aggravation of air pollution. The process of change in air quality index during the past years also shows that this problem requires serious decisions to be controlled and reduced.



For the first time in the country:

Application of Electron Back Scatter Diffraction (EBSD) technique to reveal patterns in various industrial and academic samples at Isfahan University of Technology



Setting up the modern EBSD system at IUT has created new opportunities to carry out novel research on various materials. The structure of most substances including metals is made up of various crystals and particles whose size, form and orientation have an enormous impact on their mechanical and physical properties.

Prof. Najafi, the head of IUT's Central Laboratory, announced that: EBSD is one of the most advanced characterization techniques for determination of various substances' structure. Since it is not only a highly sensitive tool with specialized operational complexities but also a costly equipment, researchers have never had the chance to create such patterns in the country. "EBSD detector of Field Emission Scanning Electron Microscopy (FESEM) has been successfully put into operation by universities and industries", he added.

Mr. Rahimzadeh, the IUT's EBSD detector expert, asserted that this technique reveals specific patterns of scattered electrons from particular angles. He added that the university now possesses the technical expertise required for setting up the equipment's parameters for a wide range of samples including but not limited to steel, Nickel-base super alloys, high-entropy alloys, cobalt-base alloys used for medical purposes, 3D-produced parts, thermo-mechanical processes, casting and so forth. These tests were previously done abroad.

As the picture shows, the structure of particles and their orientations have been depicted in various colors which can provide researchers and manufacturers with valuable information and data.

It is worth noting that Isfahan University of Technology has always been a significant center for microscopic studies since it possesses not only three advanced electron microscopes equipped with various detectors but also it has the required expertise gained through years of utilizing such systems.

Promotion of the Technological Laboratories of IUT in the National Laboratory Network for Strategic Technologies

Two technological laboratories of the “Nanotechnology and Advanced Materials Research Institute” and the set of laboratories of the Department of Textile Engineering were upgraded to "Capable" level.

Based on the annual performance report of the laboratory network of the leadership technologies made by the State Vice-Presidency for Science and Technology, an evaluation and ranking has been done for the members of the country's laboratory network.

Prof. Hamidreza Safavi, vice-president for research of IUT, stated that the country's technology laboratories are classified into various groups based on membership, experimental, active, capable, distinguished and progressive aspects, and they receive various supports according to the points they obtain. He stated

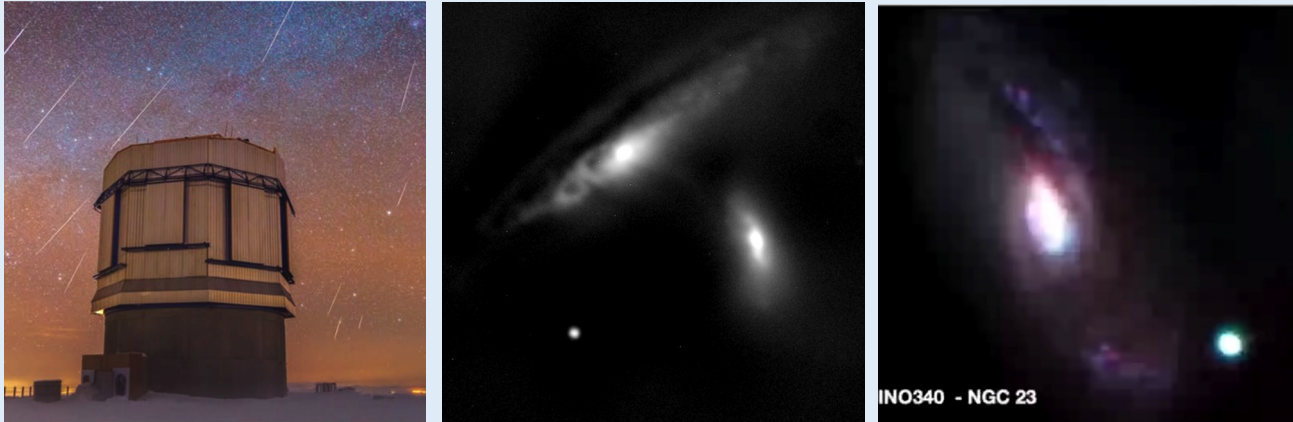


that in the ranking of the country's laboratories in the field of nanotechnology, only 2 other centers, including the University of Tabriz and the Scientific and Technological Research Organization of Iran, have reached the "capable" level. Nanotechnology and Advanced Materials Laboratory of Isfahan University of Technology is the only capable center in central Iran and the scientific hub of nano technology in Iran, that will hopefully achieve a distinguished and leading position in the near future with its further development of facilities and equipment.

This provost at IUT added that in textile engineering, the laboratory complex of the Department of Textile Engineering is the only technological center in the country to provide specialized services at a "capable" level. He also stated that this department provides technical and engineering services in laboratories of image processing, nanotechnology, mechatrotex, textile physics, technical textiles, additive manufacturing, smart textiles, and specialized workshops. In addition to educational and research services in the university, this center also implements important industrial projects.

It should be noted that the strategic technologies laboratory network has considered various supports for the member centers of the network with the aim of supporting the development of laboratory activities, promoting capabilities and helping the growth and development and improving the performance of laboratory experts. The mentioned support is done every year and based on the score of the last performance evaluation of laboratories.

Iranian National Observatory Has Recorded the First Light Image of its 3.4m Optical Telescope



Iranian National Observatory (INO) at Mount Gargash, Isfahan Province (top left photo); The first image captured by INO showing a merger of a pair galaxies at about 320 Million Light-Years away from us (top right photo).

Iranian National Observatory (INO), as the largest home-grown scientific facility project in Iran, marks a major achievement with recording the first image by its 3.4m optical telescope (top left photo). The director of INO project **Habib Khosroshahi** says that “We’ve been waiting for this moment for so long,” [2]. This is the beginning of the commissioning process, during which the telescope optics and the control system will face rigorous tests and is the time in which the team seeks international and national collaborations. The captured test image belongs to an interacting galaxy pair called Arp282 which is located at about 320 million light years away in the constellation Andromeda (top right photo).

The national telescope has tens of thousands of parts including the optics, mechanics and the control hardware and software. Although facing lots of sanctions regarding high-tech imports, Iranian scientists and engineers after more than two decades of efforts since 2000 finally have been successful to build a world-class telescope. The project was designed and developed by the Institute for Research in Fundamental Sciences (IPM) and supported by the Ministry of Science and the State Vice Presidency for Technology.

Isfahan University of Technology (IUT) with only 137 km distance away from the INO site at **Mt. Gargash** enjoys many geographical, scientific, and technological privileges to make fruitful collaborations with INO. The Department of Physics of IUT and INO are now working on a long term collaboration plan on different aspects such as defining joint postdoctoral programs on observational astronomy which will be announced in near future. The programs include joint observational programs especially about transient events, joint technological developments with participation of technical departments of IUT and collaboration on data reduction processes and data sciences. It is worth mentioning that in July 2022, the Department of Physics of IUT and INO organized an international workshop on "Transient Events and Multi-messenger Astrophysics" with the aim of inspiring and training talented students and young generation of Iranian astrophysicists and to support them for having collaboration with the INO in near future.

For more information, please see the following references : [1] http://ino.org.ir/ino_first_light/
[2] [https://www.science.org/content/article/door-open-iranian-astronomers-seek-collaborations-their-new-world-class-telescope,](https://www.science.org/content/article/door-open-iranian-astronomers-seek-collaborations-their-new-world-class-telescope)
[3] <http://ino.ipm.ac.ir/conferences/workshop5/>

An Introduction to Polymer and Nano Composites Lab. in Mechanical Engineering Department of IUT
Part: 2

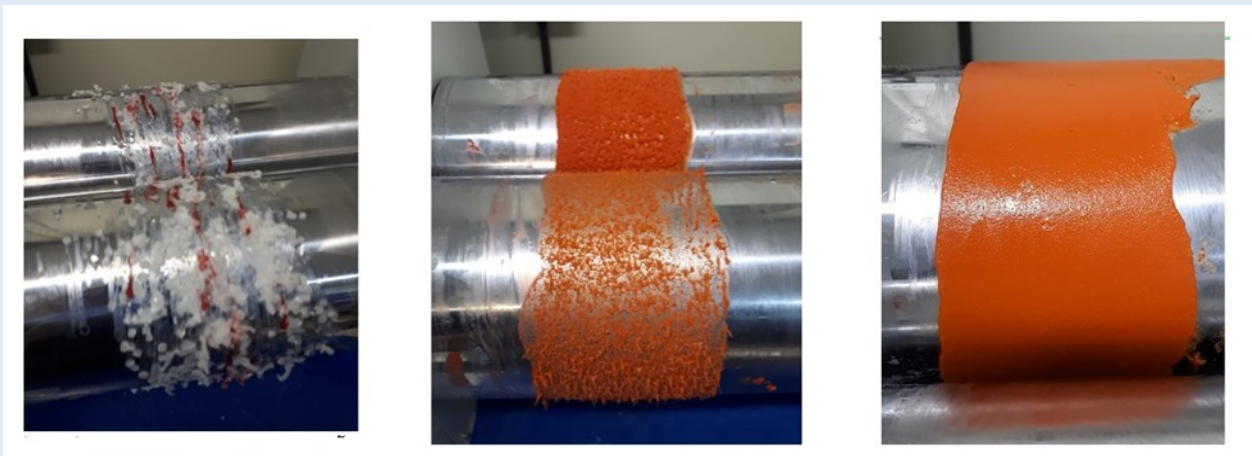
By: Prof. Mehdi Karevan

Micro-injection Molding is used to fabricate ASTM samples after preparing the melt compound of polymer nanocomposites through extrusion. Micro refers to the mass and dimensions of samples being in the order of a few grams of millimeters.



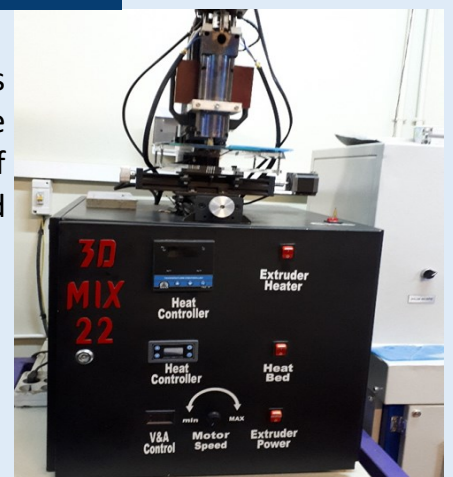
Injection molding sample fabrication based on the ASTM standards

Calendering is used to melt mix nano/micromaterials with thermoplastic polymers to transform their shapes into sheets or thin films. The device functions on the basis of intense shear forces for excellent mixing of particles with melt polymers.

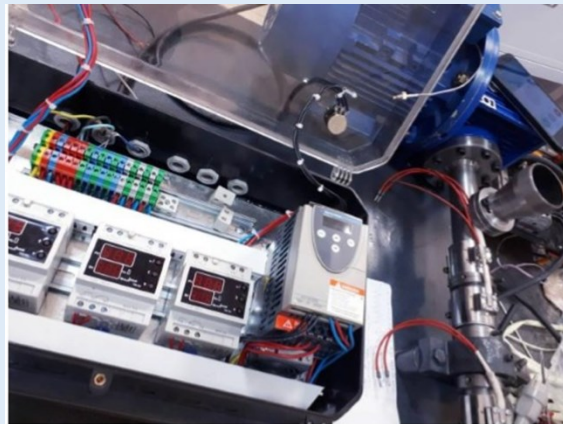


Calendered nanocomposite sheets from raw granules to homogenized product (left to right)

Liquid Deposition Molding (LDM) is used to directly print polymers mixed with nano/micromaterials. We could avoid complexities of the FDM 3D printing and shortage of engineered FDM filaments of specialty properties. Simultaneous mixing and printing are two main and key aspects of this device.



Extruder is utilized for the fabrication of thermoplastic nanocomposite at melt temperature of polymers. This step is used before micro-injection processing. The device uses shear mixing to disperse nano/micromaterials into polymer melt.



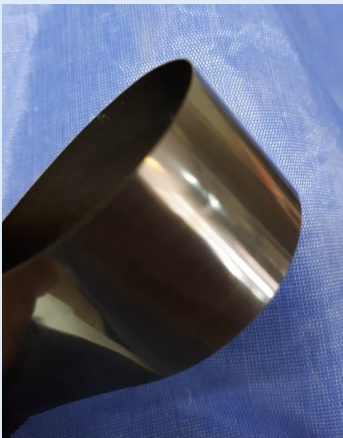
Nano-composite superabsorbent



Shape-memory nanocomposites



Nanocomposite conductive paste



Electrically conductive sheets



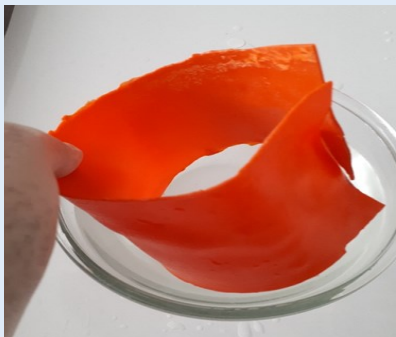
3D printer powders (SLS)



Nanocomposite synthetic papers



Biodegradable fibers



Shape-memory smart biomedical sheets

In order to expand the university's international scientific interactions with overseas academic institutions, the IUT International is publishing this electronic Newsletter on international relations in line with the IUT mission toward a Green University.

You are invited to register your email here to receive every new issue of the Newsletter upon its publication. You can also correspond with the editorial board from here to convey your valuable comments and suggestions, and send materials related to IUT to be published in future issues of the Newsletter.

To see the previous issues and more information on the newsletter, please click here.

In addition to being distributed via social networks, this Newsletter will also be available through the following QR code. Your constructive participation in this path will guide us toward our goals.



Volume 4, Issue No. 1

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IUT International Newsletter is a periodic E-newsletter to be distributed among IUT students and staff.

Your constructive and valuable comments and suggestions are most welcome.

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Special Thanks to Prof. Majid Salamat , Prof. Mehdi Karevan , Prof. Soroush Shakeri ,IUT Public Relations and IUT International Staff for their great help.