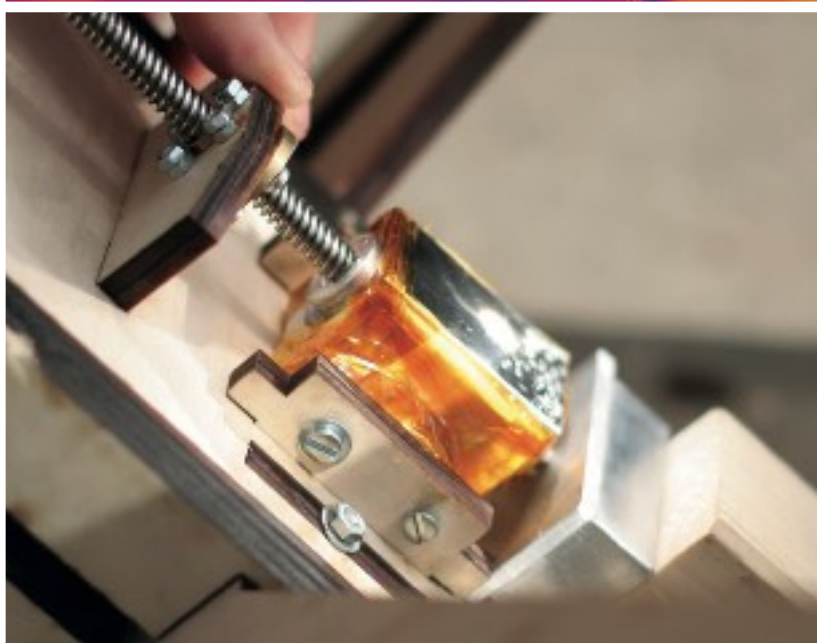
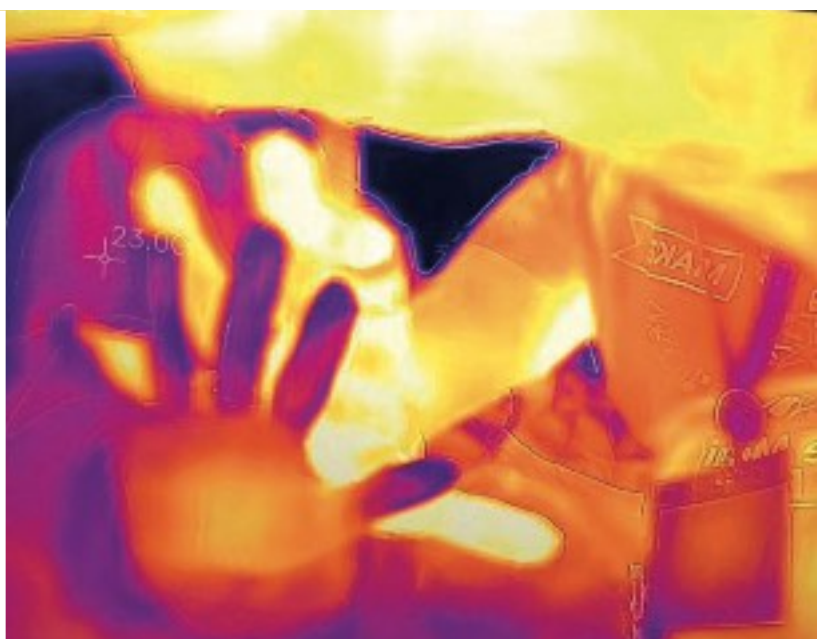


ICTP SCIENTIFIC FABRICATION LABORATORY
SCIFABLAB
2014 - 2020

HIGHLIGHTS OF STEM PROJECTS & ACTIVITIES





Palestinian and Moroccan students training at SciFabLab



Hackathon at SciFabLab: NASA Space-Apps Challenge

#LOWERCOST
#PhysicsForAll





DESCRIPTION

In 2014, the Science Dissemination Unit at the Abdus Salam International Centre for Theoretical Physics realised how **technology could draw people into science**. The **Scientific Fabrication Laboratory (SciFabLab)** was founded as a **modern, interactive way to spread science and access to science**. As part of a large world-wide community of maker spaces, SciFabLab exists to support Science, Technology, Engineering and Mathematics (STEM) education and help bring creative ideas to life, for the benefit of all.

The SciFabLab has multiple goals and tools to pursue by:

- doing **science outreach**: spreading the love of science and technology
- facilitating the creation of scientific fabrication laboratories and other maker spaces in **developing countries**
- assisting with research projects and the development of affordable technologies
- embracing new technologies and their possibilities
- providing scientists, students, teachers, and public **opportunities to learn** new skills and tools to make
- promoting the organisation of Maker Expo events and show-and-tell inventor's exhibits in developing countries to motivate young people into science and research
- organising Science & Society activities including workshops on Science Dissemination for the Disabled, Maker Faire events and NASA SpaceApp Challenge Hackathon

The SciFabLab is **open to all**, working to spread enthusiasm for science and technology, to promote the use of affordable and accessible digital tools, and to **provide opportunities** to make new devices and learn new things. The goal is to provide interactive, fun, hands-on exploration of "3D", tangible learning.

ABOUT ICTP



The Abdus Salam
International Centre
for Theoretical Physics



Founded in 1964 by the late Nobel Laureate Abdus Salam, ICTP seeks to accomplish its mandate by providing scientists from developing countries with the continuing education and skills that they need to enjoy long and productive careers. ICTP has been a major force in stemming the scientific brain drain from the developing world.

<http://www.ictp.it>

ICTP is governed by UNESCO, IAEA, and Italy, and is a UNESCO Category 1 Institute.



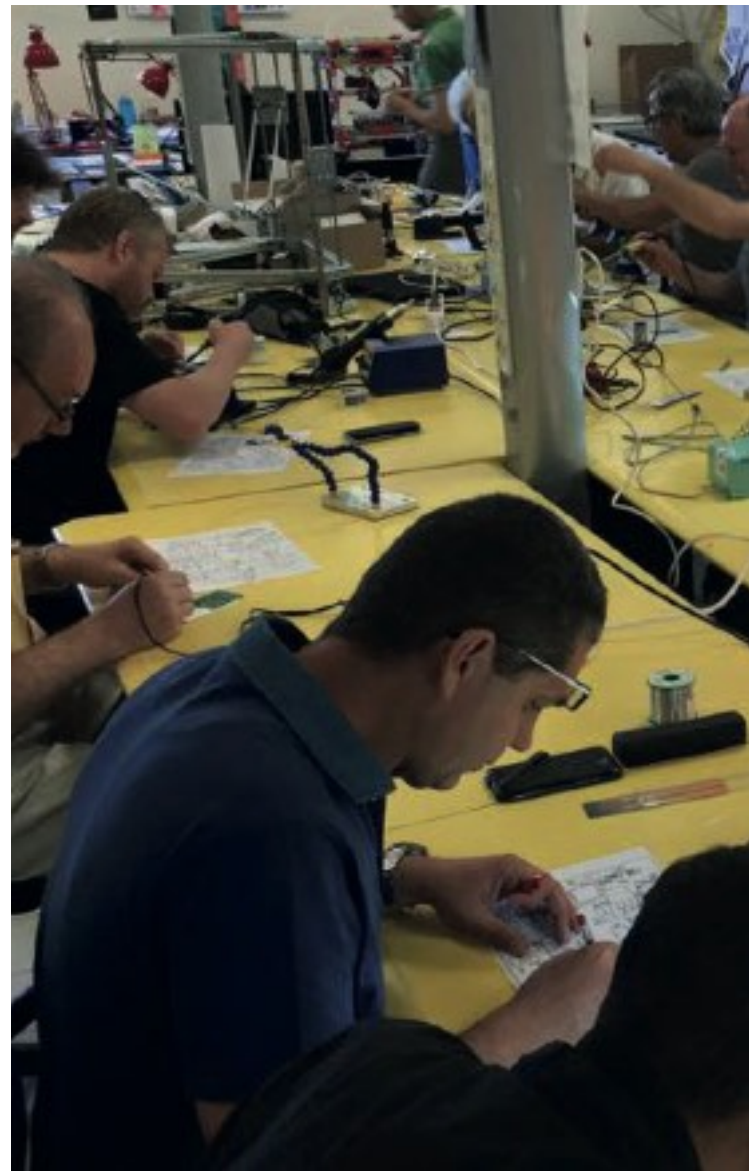
A DAY @ SciFabLab

There is always a lot going on at the SciFabLab, with many visitors and users working on a wide variety of projects, using a wide range of digital technologies. ICTP's SciFabLab is equipped with modern and versatile computer-controlled tools for rapid prototyping, such as 3D printers, 3D scanners, CNC (computer-controlled milling machines), and laser engraving and cutting machines. The SciFabLab facilitates projects in science, education and sustainable development, including works focusing on robotics, electronics, micro-controllers, scientific apps, and 3D printing.





The SciFabLab reaches a total of 1,500 visitors every year on average. Foreign diplomats and distinguished scientists, teachers and students, journalists and citizens, kids and families: they are visiting the SciFabLab when touring the ICTP and they all love to meet its community, composed by makers, inventors, students, and researchers.



Users come from many places and backgrounds: students from the Universities of Trieste, Udine and Ljubljana have developed their Bachelor's Theses at the SciFabLab. A number of high school students, primary school students, and others have visited for short projects. Developers, scientists, and makers from all over the region and the world have attended workshops and worked on projects at the SciFabLab.



Anyone can become a user of the SciFabLab, setting up a project and collaboration with the core staff. Anyone can be a visitor when the SciFabLab is open. Thanks to funds from the Municipality of Trieste, technical assistants are available 3 whole evenings per week to welcome guests and visitors.

INTERNATIONAL WORKSHOPS & OPEN EDUCATIONAL ACTIVITIES



Soldering Course for Beginners (2016)

Hands-on training organized in collaboration with C.I.S.A.R. Trieste.



m-Science
Sensing, Computing and Dissemination

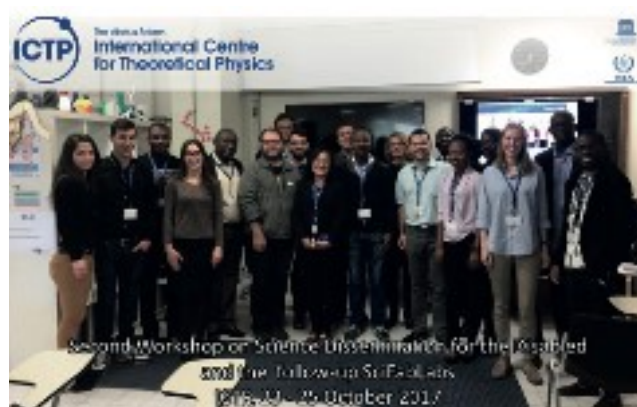
Editors: E. Cossentino • M. Zennaro

“m-Science” (2014)

This Workshop on “Mobile Science” comprised discussions on three main subjects of interest with a great impact on the society: sensing, computing and dissemination of scientific knowledge by the use of mobile devices.

“Science Dissemination for the Disabled” (2014 and 2017)

In this activity innovative technologies and projects were explored to support people with disabilities to allow them to study science.



“Fablabs and Makerspaces for Science” (2015 and 2017)

The aim of these events has been to analyse new ways to establish and support the creation of Scientific-themed Fablabs (SciFabLabs) in remote areas in order to inspire curiosity and nurture young scholars and new generations of scientists without any exclusions.





Olivetti Programma P101 Repair (2015)

The world first desktop computer Olivetti Programma 101 was brought back to operation after 45 years by using an ad- hoc soft belt printed with the low-cost 3D printers of the ICTP Scientific FabLab under the presence and guidance of Gastone Garziera and Giovanni de Sandre, from the famous Pier Giorgio Perotto's Group at Olivetti, Ivrea, Italy.

3D Printer Assembling

The first open course about the construction of a 3D desktop printer Hephestos Prusa i3 was organized in early 2015. Furthermore, visiting scientists from Nigeria, Cameroon and Colombia have also assembled their institution's 3D printers while training at the SciFabLab. In the last year, the interest on the use and implementation of 3D printing technologies in STEM education has increased continuously.



Palestinian and Moroccan students training at SciFabLab

Four Palestinian students from Bethlehem University, who run a science outreach program in the West Bank called Science4People, together with two students from the University of Beni Mellal in Morocco participated to a special training at ICTP's SciFabLab to learn how to use and code for 3D printers and other affordable digital tools.

Public Seminars (on, and outside, Campus)

- 3D Printing, 3D Modelling and Open FabLab Technologies among other topics.
- High Schools Educational Workshops and Teachers' Seminars (2017).
- Training on Arduino micro-controllers and 3D Printing.



Activities Hosted at SciFabLab (2017-2019)

- Joint ICTP-IAEA Workshop on *"Environmental Mapping: Mobilizing Trust in Measurements and Engaging Scientific Citizenry"*.
- ICTP-ICT4D Workshop on *"Open Source Solutions for the Internet of Things (IoT)"*.
- *"TSFF Goes Virtual"*, training activity on Virtual Reality organized by Trieste Film Festival and Associazione Alpe Adria Cinema in collaboration with the ICTP SciFabLab.
- Inquiry-Based Science Education, an introduction (CESAME).
- Joint ICTP-IAEA School on LoRa Enabled Radiation and Environmental Monitoring Sensors.
- Advanced Workshop on Technology for Sustainable Development: Low-Cost Tools to support Scientific Education.
- Workshop on Rapid Prototyping of Internet of Things Solutions for Science.



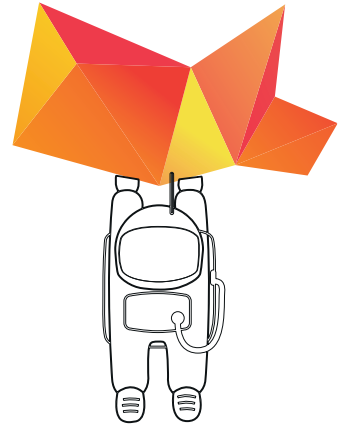


NASA Space-Apps Challenge (2018)

International hackathon occurring over 48 continuous hours simultaneously in 200 cities around the world, including Trieste. The goal was to share ideas and engage with open data to address real-world problems, on Earth and in space. The Trieste event was organized by the SciFabLab of the ICTP with the Patronage of the Municipality of Trieste and the University of Trieste, and the sponsorship of the United States Consulate of Milan.

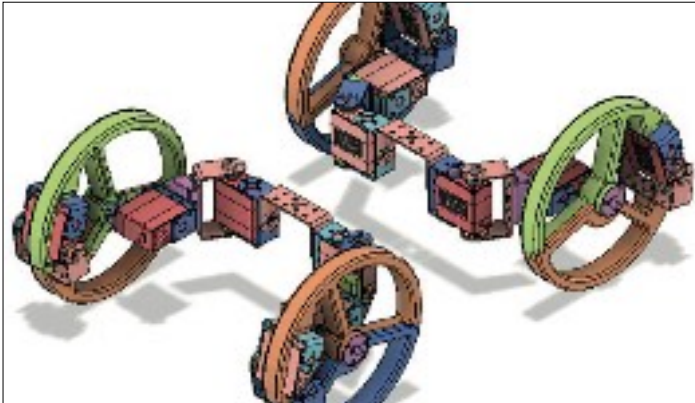


THE FINALIST PROJECTS



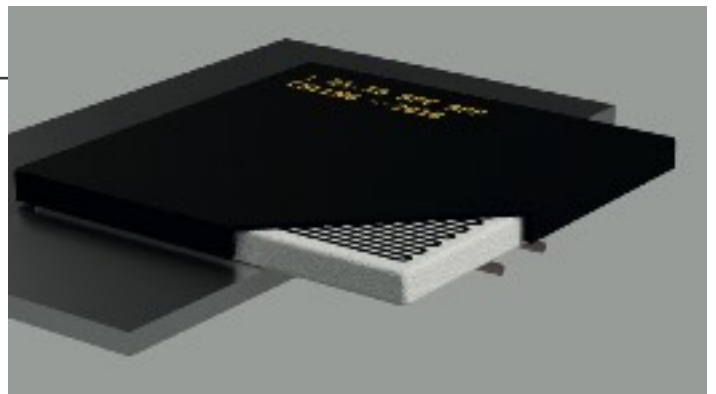
ALL TERRAIN ROVER | INVENT YOUR OWN CHALLENGE

The rover can move using either wheels or legs, is based on Arduino Due and uses a "Space Mouse" 3D controller. It is a peculiar four-legged crawler that can fold the legs transforming them in wheels. While in "wheel mode" it can efficiently save energy, in "crawler mode" it will overcome unstable terrain. The power and control of the distal motor is brought through slip rings, as a normal cable cannot be use while in wheel mode.



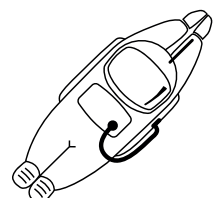
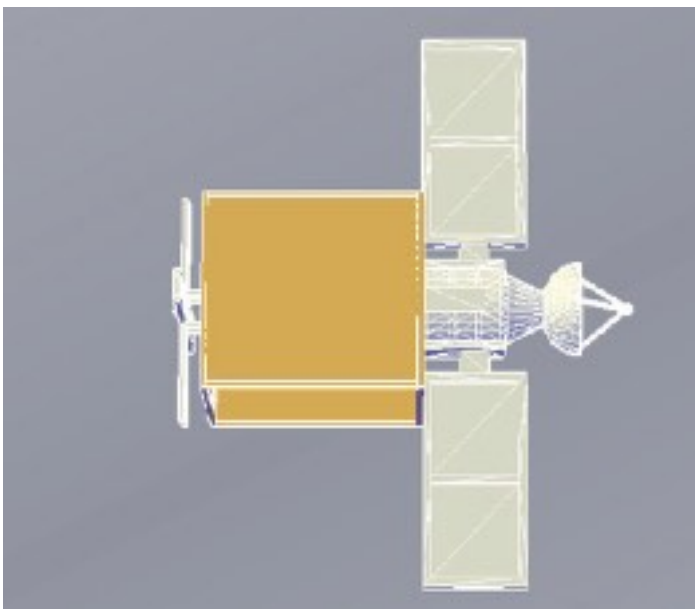
SYLAR | DESIGN BY NATURE

Inspired by the internal structure of the human skin we have tried to make the TPS' tiles proprioceptive. When an impact breaks the borosilicate cover, it breaks the resistance wire placed immediately under it, opening the circuit and triggering the alarm.



TEAMON | REMIX THE GOLDEN RECORD

If you could launch a time-capsule into space, what would you put in it? We thought of storing data in DNA to share information with aliens by appealing to emotions. We would show them our successes, as well as our mistakes in order to avoid repeating them.



LARGE PUBLIC EVENTS

Open Days

SciFabLab Open Days are organized every year, together with the special event “*Arduino Day*” and other public activities within the “*European Maker Week*” with many demo activities.





Interactive LHC Tunnel by CERN (2016)

This exhibit produced by CERN is an interactive installation where people can play with elementary particles (the building blocks of the Universe) like the Higgs Boson, acting within a 3D virtual environment, while learning some knowledge of high energy physics. Guidance from local researchers working in the CERN ATLAS experiment was provided.

Trieste Science Picnic at ICTP Campus (2016, 2019)

This has been a free event open to all teachers and students of the Friuli Venezia Giulia region and beyond, aimed to promote science with an informal style, through demos and practical activities. Many interactive experiments, performances, educational and creative workshops and speeches from science communicators and scientists were organized. About 2,200 students participated in 2016, and from 2017 this event has been included within the Trieste Mini Maker Faire. In 2019 a whole day was organized for the second time as a free event for schools of all degrees.



Trieste Mini Maker Faire (2014, 2015, 2016, 2017, 2018, 2019)

Since May 2014, the ICTP SciFablab in collaboration with the Municipality of Trieste organizes every year this popular event under license of Maker Media. The Trieste Mini Maker Faire brings together makers, inventors, scientists, artists and other passionate creative enthusiasts coming from the Triveneto area of Italy as well as from Austria, Slovenia, Croatia and beyond. While showing their projects, participants share their passion for making, and inspire visitors to make things by themselves. Special attention is always given to ideas and projects of educational interest that can be shared and implemented in developing countries. Each year about 16,000 people visit the ICTP Miramare Campus to participate in these events.

See: <http://trieste.makerfaire.com>



Trieste

Mini
Maker
Faire®



ICTP's SDU in ESOF 2020

“Science in the City” Festival

Since May 2014, the ICTP SciFabLab organizes outreach activities in collaboration with the Municipality of Trieste. The SciFabLab –also present during the EuroScience Open Forum (ESOF) 2020 in Trieste under the “Science in the City Festival”– embraces activities for the public engagement in science, technology, education and mathematics.



OUTREACH BEYOND CAMPUS

During 2014-2020,
members of the ICTP SciFabLab
have participated in numerous events
and activities open
to the public in many different places.

For example:





“TRIESTENEXT” (TRIESTE, ITALY)

with a big pavilion of the “Trieste Science Picnic”



PARTICIPATION IN SEVERAL RADIO & TELEVISION PROGRAMS

To spread and disseminate the activities of the ICTP Science Dissemination Unit and its SciFabLab at local and regional stations





REGIONAL “MAKER EXPO OF OPEN TECHNOLOGIES AND INCLUSIVE DEVELOPMENT”

In mid-August 2017 a gathering of local makers, scientists and creative people took place in Cartagena, Colombia. This activity was organized by the ICTP Science Dissemination Unit and the University of Cartagena. The town of Cartagena was selected since it has a considerable number of high educational institutions and a thriving industrial zone in sectors that require constant innovation. The second edition was organized at the University of San Carlos, Guatemala City, Guatemala in the second semester of 2018.

The young people in the region need new opportunities for showcasing their talents and need more dedicated spaces as the city grows. The first Maker Expo aimed at exploring all these needs. The event accepted the registration of projects in six categories: Internet of Things, Robotics and Home Automation, Software, Games and Start-ups, Applied Basic Sciences, Control and Automation. Attendance was free for exhibitors and the public, with a total of about 500 attendees.

See: <http://indico.ictp.it/event/7655/>
<http://indico.ictp.it/event/8345/>



FEW EXAMPLES OF PROJECTS



Prototype for Inverted 3D Printing of Complex Objects

by Marco Baruzzo

The idea for this inverted 3D printing prototype is to be able to save plastics while 3D printing without using support material and improving the printing quality.



3D Print of Anatomical Replicas

by Carlo Campana, (a collaboration with 3dprintersurgery.com)

3D patient-specific anatomical replicas processed from Tac and Magnetic Resonance data for diagnostic purposes.



MANIpolare per Comunicare

by Elena Dall'Antonia

Educational prototype kit for deaf-blind children to assist in learning sign language, using 3D printing and Arduino. Winner of national awards.

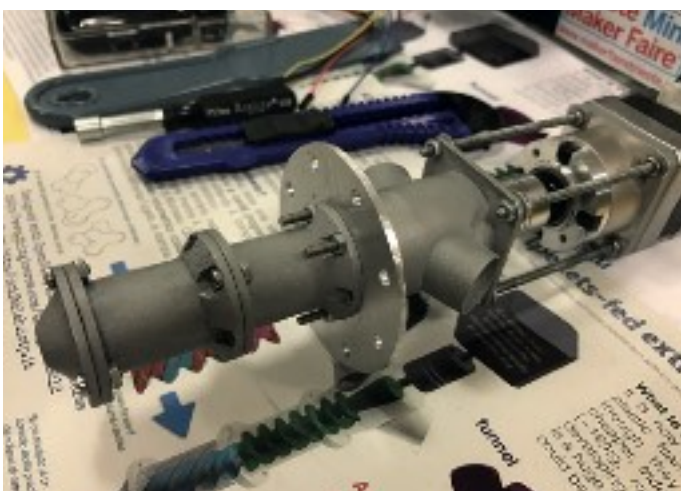
See: <http://www.youtube.com/watch?v=PE603qiwYg8>



Pellextruder

by Carlo Fonda, Marco Baruzzo

Study for the dynamics of multi-lobe Moineau's Progressive Cavity Pump as applied to the recycle of plastic and the production of filament for direct 3D printing. This is an open source prototype still under development.



Prototype of a Low-cost Meteorological Station

In collaboration with ICTP TC/ ICT4D group

Weather station entirely printed in 3D at SciFabLab.



Hand(s)Home

by Giorgia Sperandio

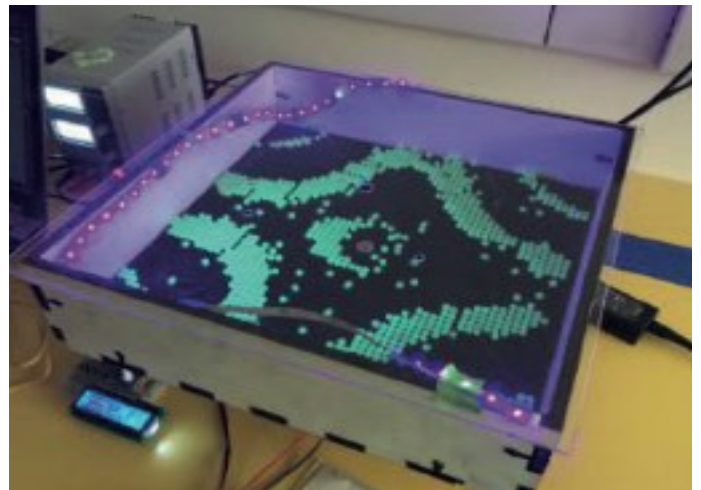
Simplified interface for home automation designed especially for users with disabilities or the elderly, realized using Arduino micro-controller, 3D printing and laser cutting.

Chladni Figures

(project #PodobaZvoka)

by Taddea Druscovich

Interactive visualization and understanding of nodal patterns on vibrating plates (Chladni figures), with the peculiarity of replacing sand with larger spheres moving on a 3D printed net of different geometries and under frequencies adjusted via an Arduino micro-controller.

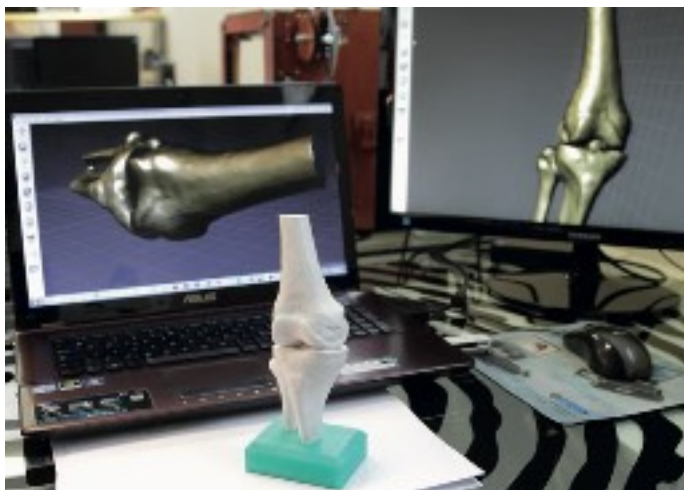


IMAGINARY Open Mathematics Exhibition

by Marco Rainone, Enrique Canessa

17 complex objects of the IMAGINARY Open Mathematics Exhibition of the Mathematisches Forschungsinstitut Oberwolfach in Germany were reproduced in the SciFabLab using 3D printing technologies. The target groups of the platform includes museums, universities and schools.





Eso-skeleton from CT Scan

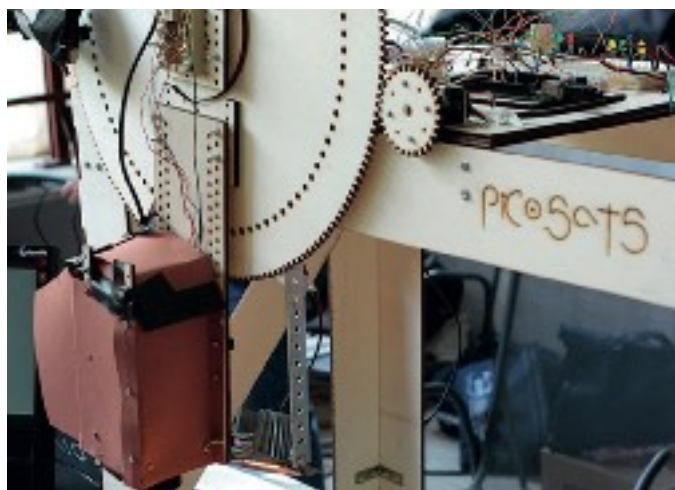
by Giancarlo Pellis

This is a light, 3D eso-skeleton (i.e., customized and personalized) from the elaboration of a CT scan data. By analysing the roto-translational movement of the knee, it can reproduce in a very reliable way the kinematics of the lower limb.

"Picosat" Photometer Model

by Michele Maris and Students

This is a light, small cube having solar cells, battery, GPS, compass, a small transceiver and a CPU that could be sent into space as ballast weight during the launch of bigger satellites.



Water Rockets Launch System

Built by Science Industries, Trieste

Launch of rockets made with plastic bottles and powered by pressurized air and water. The set up includes an Arduino- controlled command console and tracking station.

Augmented Reality SandBox

Scientific educational exhibit developed by UC Davis (USA) and made at SciFabLab

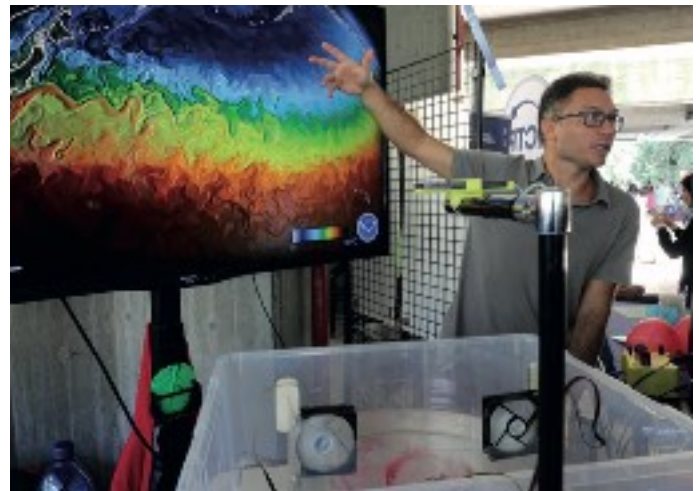
Hands-on exhibit combining a real sandbox, virtual topography and simulated water created using a MS Kinect 3D camera, powerful computer simulation and visualization software, and a video projector. It allows to create realistic geographical models by shaping real sand, which is then augmented in real time by an elevation colour map, topographic contour lines, and simulated water.



Weather in a Tank

Scientific educational exhibit developed by MIT (USA) and made at SciFabLab

Rotating water tank that allows to understand fluid dynamics experiments and atmospheric/oceanic phenomena.



Cromopolis

by Sara Sossi

Cromopolis is motivated by souvenirs which in reality reflect experiences and by the frottage technique of a coin or a texture. The idea is that a tourist puts a paper or a postcard on a 3D printed relief of a Tourist attraction and colors this page. With the pressure of the pencil, the icon is impressed on the paper. Cromopolis was the winner of the 2014 edition of the Map Pin competition.

Voice-Controlled Artificial Handspeak System

by Jonathan Gatti, Livio Tenze, Enrique Canessa

A man-machine interaction project aiming to establish an automated voice to sign language translator for communication with the deaf using integrated open technologies (OpenSCAD, Arduino) and Raspberry Pi mini-computer, and manufactured with a low-cost 3D printer which smoothly reproduced the alphabet of the sign language controlled by voice only.

See: <http://www.youtube.com/watch?v=J5whsEsGr4s>

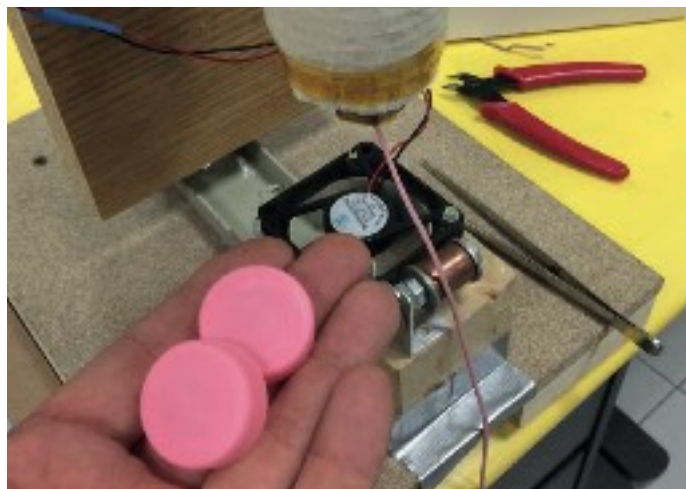


From Bottle Caps to 3D-Printing

by Javier Montoya

In-house production and use of recycled plastic as filament (raw material) for low-cost 3D-printing. This work was done in collaboration with condensed matter physicists from the Interdisciplinary Research Group GruMoc at the University of Cartagena, Colombia.

See: <http://scifablab.ictp.it/author/jmontoya/>

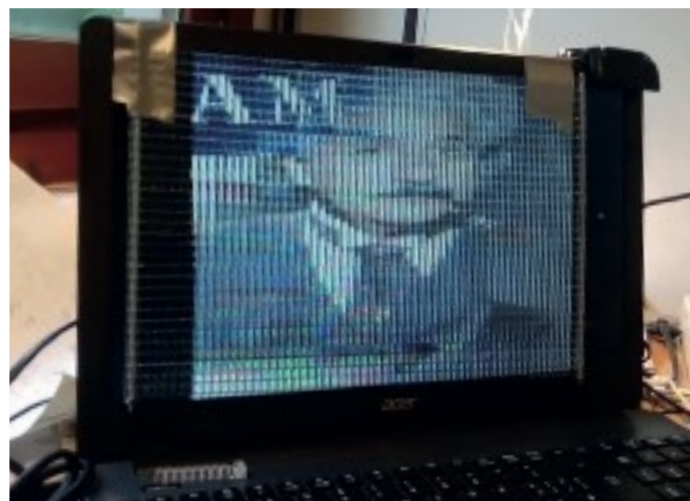


DIY Lenticular Lens and Open3DStream

by Enrique Canessa

Demo of real-time lenticular video/image streaming using Open3DStream software together with the lenticular lens designed and fabricated at ICTP SciFabLab.

See: <http://www.youtube.com/watch?v=ZKEK9I6TvHM>



3D Printing Directly from PET Plastic Bottles

by Enrique Canessa, Carlo Fonda and ICTP SciFabLab Team

Using a simple and fast method to produce thin, spiral filament cut from PET plastic bottles at room temperature (without pellets) one can now 3D print such filaments using the conical auger screw at 260 °C designed by Mahor Muniz (from Spain). To control the flux, a simple dual-helix stator (easy to build and clean) is being studied and built via CNC Milling at the SciFabLab.

See: <http://www.youtube.com/watch?v=eUtr9IWUHSU>



DIY Cloud Chamber

By Marco Baruzzo, Carlo Fonda

Do-It-Yourself (DIY) particle detector or “Wilson’s Cloud Chamber” built by the ICTP Scientific FabLab with recycled and used parts, and 8 double-layer Peltier Cells (TEC).



3D Terrain Mapping

by Gaia Fior, Carlo Fonda

3D demo model of Biševo island, Croatia. 3D printed in large scale (multiple tiles), for video-projecting augmented reality information on top of the model such as satellite map, roads, temperature and other info.



Plastic Injection Molding Machine with Solar Power

by Sara Sossi, Carlo Fonda

Prototype devices have been designed, built and tested with the goal of being able to melt and mold a small quantity of plastic granules (from waste plastic) using the power of the sun concentrated by a Fresnel lens and with an optimized metal extruder fabricated in-house.

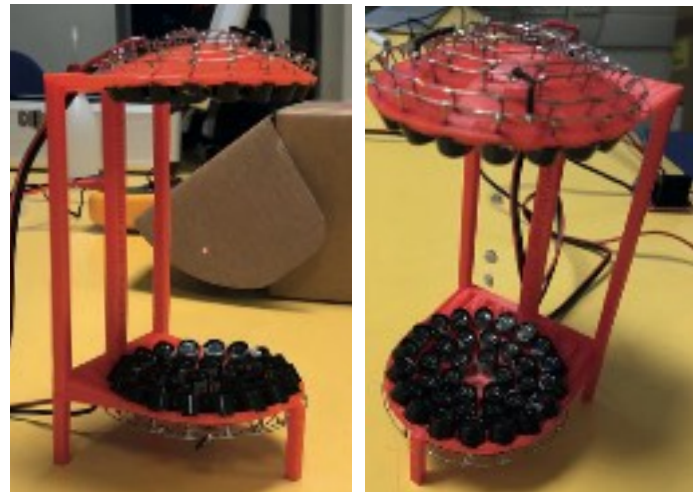




Acoustic Levitator

by Paolo Lazzari, Arnau Mir

Acoustic levitator to explore possible applications of chemostat based on acoustic levitation rather than the classical tank experimental setup. The project could have impact as experimental tool for biogeochemistry.



Thermoplastic Breast Immobilizer Prototype for SYRMA-3D project

by Lucía Mariel Arana Peña, Carlo Fonda


A 3D-printed model of a breast, generated parametrically with OpenSCAD using standard biometric data from published research papers, has been used to produce -by a very affordable and simple thermoforming procedure- a prototype of a customisable "supporting structure" for the breast, with the goal of improving the quality of medical imaging done at the Synchrotron facility in Trieste.



PUBLICATIONS

- *Morphing a Stereogram into Hologram*, E. Canessa, L. Tenze, arXiv:1905.01727 [eess.IV] (2019)
- *Trieste Mini Maker Faire - Catalog* (2017) ISBN 978-9295003-62-0 (2018)
- *Study of Moineau-based Pumps for the Volumetric Extrusion of Pellets*, E. Canessa, M. Baruzzo, C. Fonda; *Additive Manufacturing* **17** (2017) 143-150
- *Making Ideas at Scientific Fabrication Laboratories*, C. Fonda, E. Canessa; *Phys. Edu.* **51** (2016) 065016
- *L'Ingegno Italiano, i FabLab ed i Maker*, E. Canessa; Book: ISBN 978-9295003-57-6 (2015)
- *FishEyA: Live Broadcasting Around 360 Degrees*, E. Canessa, L. Tenze; *Proc. 20th ACM Symposium on Virtual Reality Soft.&Tech. VRST* **14** (2014) 227-228
- *Trieste Mini Maker Faire –Catalogs*, E. Canessa, C. Fonda; ISBN 978-9295003-53-8 (2014), ISBN 978-92-9500358-3 (2015), 978-9295003-59-0 (2016), 978-92-95003-61-3 (2017)
- *IMAGINARY Math Exhibition using Low-cost 3D Printers*, M. Rainone, C. Fonda, E. Canessa; arXiv:1409.5595 (2014)
- *Voice-Controlled Artificial Handspeak System*, J. Gatti, C. Fonda, L. Tenze, E. Canessa; *Int. J. of Artificial Intell. & Appl. (IJAIA)* **5** (2014) 107-112
- *EyApp & AndrEyA – Free Apps for the Automated Recording of Lessons by Students*, E. Canessa, C. Fonda, L. Tenze, and M. Zennaro; *Int. J. Emerging Tech. in Learning (iJET)* **9** (2014) 31-34
- *Low-cost 3D Printing for Science, Education and Sustainable Development*, E. Canessa, C. Fonda, M. Zennaro (Editors 2013); Book: ISBN 92-95003-48-9






The SciFabLab will continue to grow, with as many programs, technologies, and users as it can support. Future directions of expansion include:



PROVIDING
SUPPORT FOR THE
ESTABLISHMENT
OF OTHER FABLABS
AROUND THE WORLD,
ESPECIALLY IN THE
DEVELOPING WORLD



PROMOTING THE
ORGANIZATION OF MAKER
EXPOS IN THE DEVELOPING
WORLD



INCREASING
THE VARIETY OF
WORKSHOPS AND
TECHNOLOGIES

SciFabLab, passato e futuro

**Dal robot pianista al telegrafo via whatsapp
"Maker Faire", la fiera delle 300 invenzioni**

© 2004 Blackwell Publishing Ltd, *Journal of Internal Medicine* 255: 109–116



La Olivetti Programma 101, che si può ammirare allo SciFabLab (Siviano)

Domani il "Tributo all'inventiva italiana"

"Un tributo all'inventiva italiana: ieri, oggi e domani" è il titolo dell'appuntamento in programma domani all'Ictp e targato SciFabLab. Dalle 10 alle 12 mostra del calcolatore elettronico "Olivetti Programma 101", aperta a tutti con ingresso gratuito al laboratorio nell'edificio "Enrico Fermi", nel comprensorio di Miramare. Nella medesima fascia ora-

ria, Giovanni de Sandre e Gastone Garziera, due dei componenti del team che 50 anni or sono realizzò il primo personal computer - appunto l'Olivetti Programma 101 -, visiteranno SciFabLab. Dopo la pausa pranzo, la giornata proseguirà dalle 14 alla Adriatico Guesthouse di via Grignano 9 con un incontro tra de Sandre, Garziera, Università e

Ictp SciFabLab (partecipazione a richiesta e a numero chiuso).

A seguire, dalle 17.30 alle 19, incontro aperto al pubblico con i grandi maker di ieri e di oggi "Italia, avanguardia tecnologica: dalla Programma 101 Olivetti ad "Arduino", mezzo secolo di inventiva e ricerca", moderato dal direttore de Il Piccolo, Paolo Possa-

Nuove tecnologie per

L'Ictp apre il suo nuovo laboratorio di stampa in 3D per creare oggetti con plastica

di Cristina Serra

CONFERENZA La scienza salverà il mondo

Ingegneria, di ricerca e prodotti artificiali per uso esterno. Materiali da laboratorio e tutti per il sistema logistico. Tutti e quattro in plastica, moduli e biodegradabili o addirittura riciclabili. Sono alcuni dei prodotti che escono - per ora, solo in forma di piccoli prototipi - dal 3D Lab printing, il nuovo laboratorio per la stampa tridimensionale inaugurato da poco presso il Centro internazionale di fisica teorica di Miramare.

Il laboratorio, allestito con pochi spesa, è dotato di alcuni computer per la modellazione grafica (in 2D) del modello e di cinque stampanti che, dopo aver letto le istruzioni in due dimensioni, depositano e solidificano a caldo un sottile strato di plastica colante su un apposito supporto, spostandosi poi creare l'oggetto tridimensionale secondo le indicazioni del disegno computerizzato.

La tecnologia non è nuova, ma le applicazioni sono infinite: dalla stampa di prototipi a quella di pezzi di ricambio, dalla stampa di organi umani a quella di strutture architettoniche.

La meccanica quantistica ha mostrato all'uomo i limiti del suo pensiero razionale e come altre grandi rivoluzioni scientifiche ha cambiato il suo ruolo nella natura. Ne parla domani alle 14.30 Sergio D'Agostini, professore dell'Università "Sapienza" di Roma, in una conferenza pubblica al Sala di Trieste (via Garibaldi 365). Si parlerà di fisica quantistica, teoria dei campi quantistici e di gravità quantistica, ma verranno anche trattati "alcune lezioni dalla nozione di conoscenza e del ruolo della cultura nella nostra società". La conferenza si terrà in italiano.

La, del gruppo Scienze disseminazione, dell'Ictp - non è quello di produrre oggetti più o meno riciclabili o biodegradabili, ma di creare tecnologia a base



Il macchinario per la stampa tridimensionale

Il file di plastica quasi sempre biodegradabile con cui si creano gli oggetti con la tecnologia di stampa 3D. I materiali vanno da polveri a liquidi, da fili a fogli.



L'Ictp festeggia il "compleanno" del Fablab

Open day al Centro di fisica di Miramare. Serracchiani: «È il futuro della scienza applicata all'industria»

«È un'iniziativa importante perché è il futuro del laboratorio, del fare scienza, dell'applicare la scienza alla realizzazione industriale. Spazi dove ricerca, formazione e creatività si uniscono insieme per trovare il progresso e la crescita della società». Lo ha detto la presidente della Regione, Debora Serracchiani, che ieri mattina, accolta dal direttore del Centro internazionale di fisica teorica Abdus Salam (Ictp) di Miramare, Riccardo Quaresima, e dai suoi collaboratori, ha partecipato al primo compleanno del Scientific Fabrication Laboratory (SciFabLab), festeggiato con un open day e con l'inaugurazione di nuovi spazi. Ictp e Regione, tra gli altri, anche il sindaco di Trieste, Roberto Cosulich, e il rettore dell'università triestina, Maurizio Ferraglia. Il SciFabLab è un laboratorio che rende possibile l'attività della ricerca e della didattica in fisica, ingegneria e artigianato del futuro.



In visita al laboratorio SciFabLab del Centro di fisica teorica (foto Lazzarini)



Serracchiani tra il sindaco Cosulich (a sinistra) e il rettore Ferraglia

Il mondo, rendendo accessibile la modellazione e la fabbricazione digitale. Lo SciFabLab dell'Ictp di Miramare è una realtà giovane e innovativa e disponibile all'agosto dello scorso anno di ricercatori, ingegneri e artigiani del fu-

ture. Stampanti 3D, macchine di per il taglio laser e altre apparecchiature d'avanguardia digitale sono le prerogative di questo spazio. Un luogo dove le idee possono diventare prototipi, oggetti con cui

può essere esposto oltre 10 anni di quello che il mondo ci propone già con le sue idee e progetti. Carlo Pavesi e Sergio D'Agostini, i due ricercatori responsabili della struttura. Nei suoi primi 355 giorni di attività, lo SciFabLab ha avve-

na di tecnologia avanzatissima, quali schede elettroniche, circuiti a microprocessore, decodificatori di stampanti 3D, calcolatori personalizzati, la creatività è immediatamente fruibile. Un oggetto viene immaginato, disegnato su file, e poi stampato grazie alla tecnologia di stampa 3D. Modelli di caso, aerei, barche, e naturalmente anche prototipi in grandezza naturale. Parallelamente, ogni progetto può essere condiviso con qualsiasi laboratorio in ogni parte del mondo. «Siamo aperti a tutti, gratuitamente, basta avere delle buone idee», aggiunge Pavesi.

Questo polo di eccellenza, dunque, permette agli scienziati che si occupano non solo di avere una soluzione strutturale di ricerca a disposizione, ma anche di condividere scoperte e "know how" con tutti i "makers" che aderiscono alla rete internazionale del SciFabLab e che una volta alanno si ritrovano a contatto con il pubblico in occasione della Trieste Mini Maker Faire. Un altro successo della scienza (con un totale di circa 2500 visitatori) made in Trieste.

ALLE 17.30 I grandi maker di ieri e di oggi a confronto in via Grignano 9

Appuntamento, oggi, con "Un tributo all'inventiva italiana: ieri, oggi e domani", grazie a Ictp - Centro internazionale di fisica teorica Abdus Salam e a SciFabLab (Scientific Fabrication Laboratory), il laboratorio per ricercatori, creativi, inventori e artigiani aperto all'edificio "Enrico Fermi", nel comprensorio di Miramare. Il programma prosegue dalle 10 alle 12 la mostra del calcolatore elettronico "Olivetti Programma 101", con ingresso gratuito per tutti in SciFabLab e visita di Giovanni de Sandre e Gastone Garziera, due dei componenti del team che realizzò il primo pc. Dopo il break, la giornata proseguirà dalle 14 alla Adriatico Guesthouse di via Grignano 9 con un incontro tra de Sandre, Garziera, Università e Ictp SciFabLab. Dalle 17.30 alle 19 sempre in via Grignano 9, incontro aperto al pubblico con i grandi maker di ieri e di oggi "Italia, avanguardia tecnologica: dalla Programma 101 Olivetti ad "Arduino", mezzo secolo di inventiva e ricerca", moderato dal direttore de Il Piccolo, Paolo Possamai, e che vedrà partecipare Alessandro Ranellucci (direttore Ictp).

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C'è tempo fino a venerdì per iscriversi all'incontro organizzato per i cinquant'anni dell'Ictp

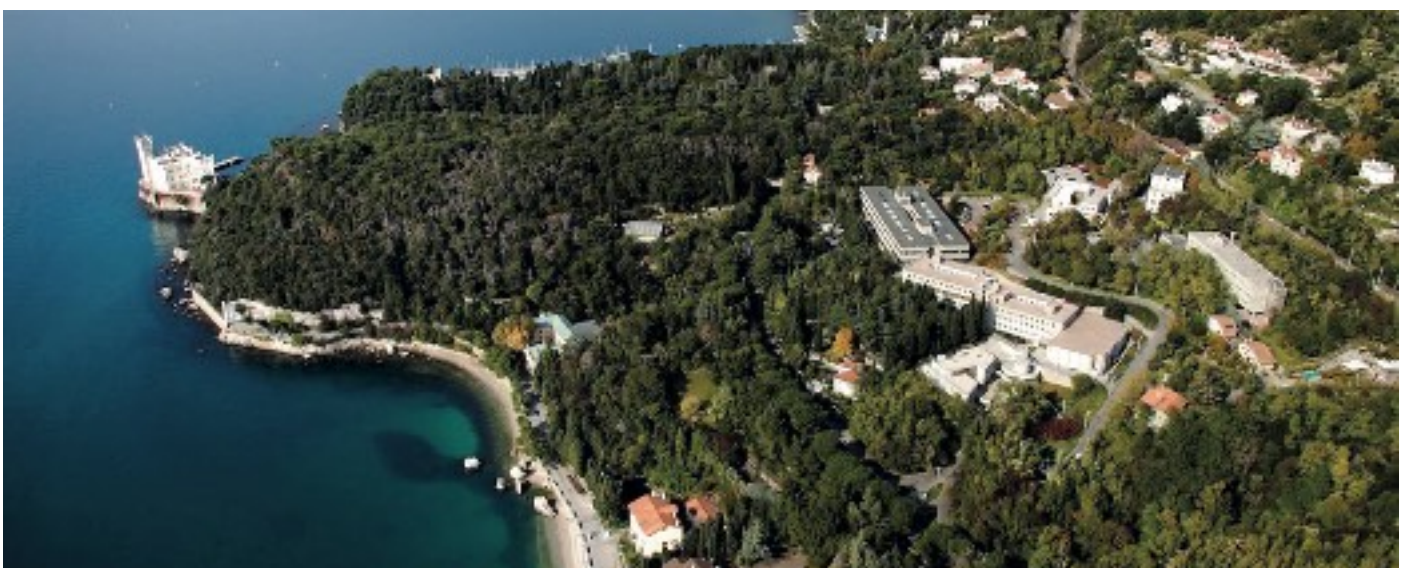
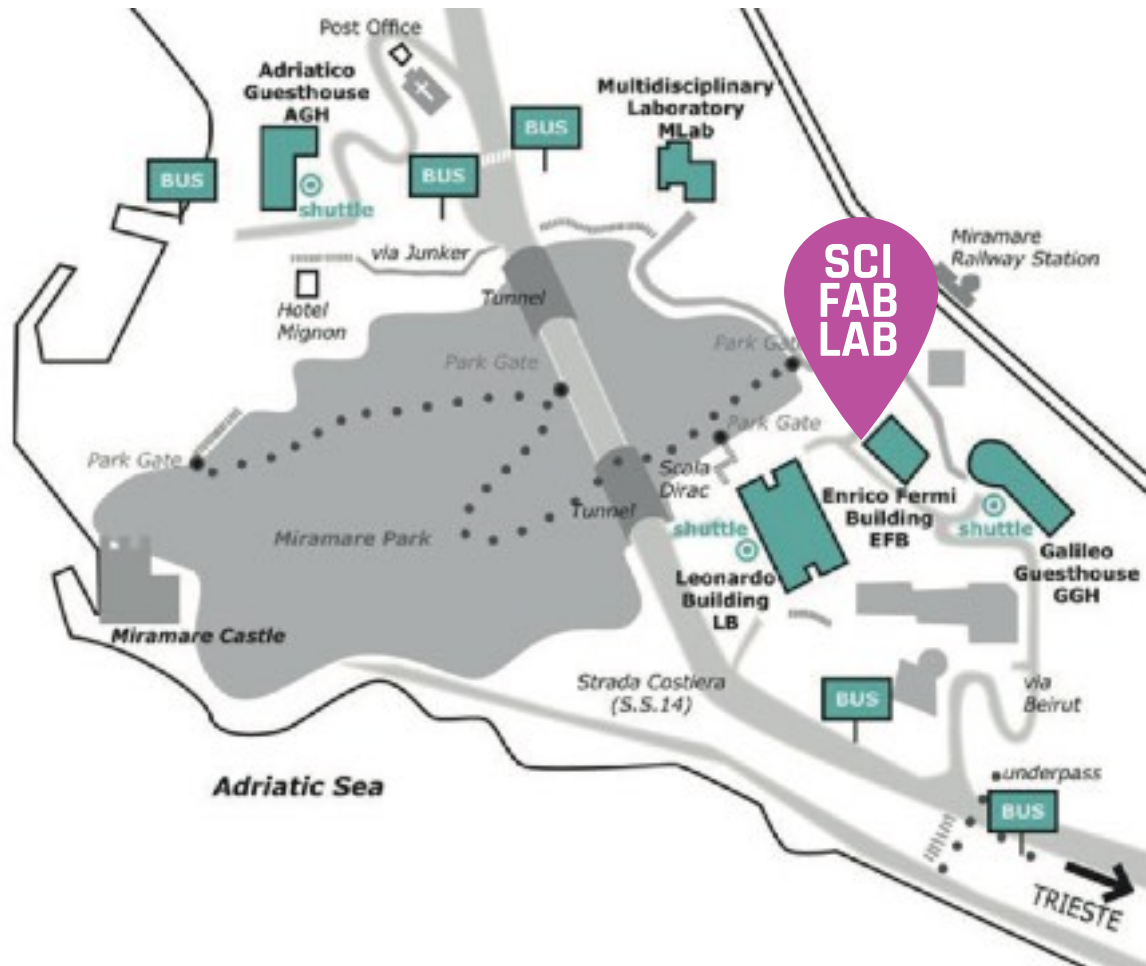
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ATTREZZATURE

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WE ARE HERE



"Scientific thought, and its creation, is the common and shared heritage of mankind"

Prof. A Salam
At 1979 Nobel Prize in physics' ceremony



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