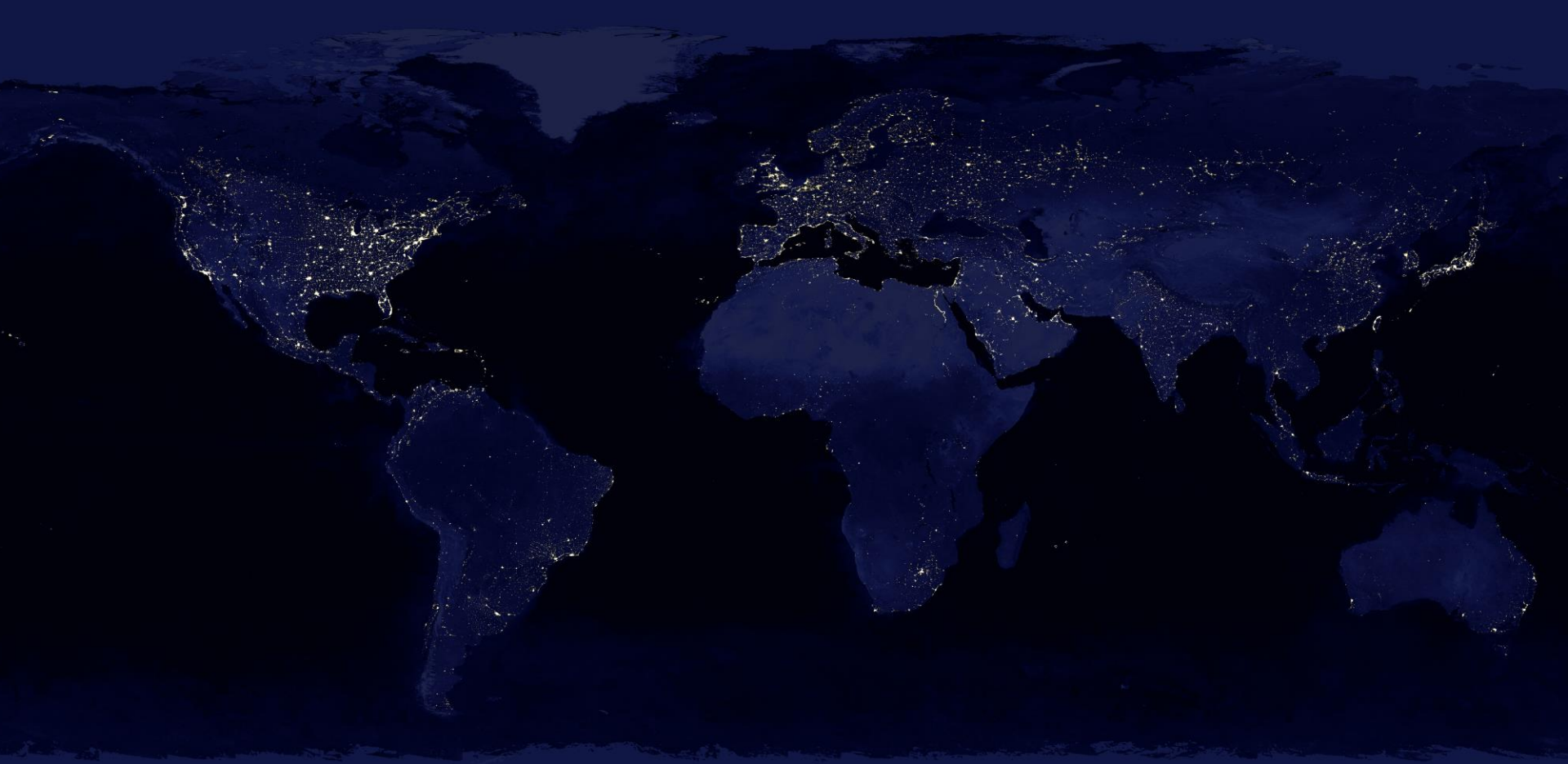
Conferenza programmatica e di organizzazione

15-16 aprile 2024



Luce

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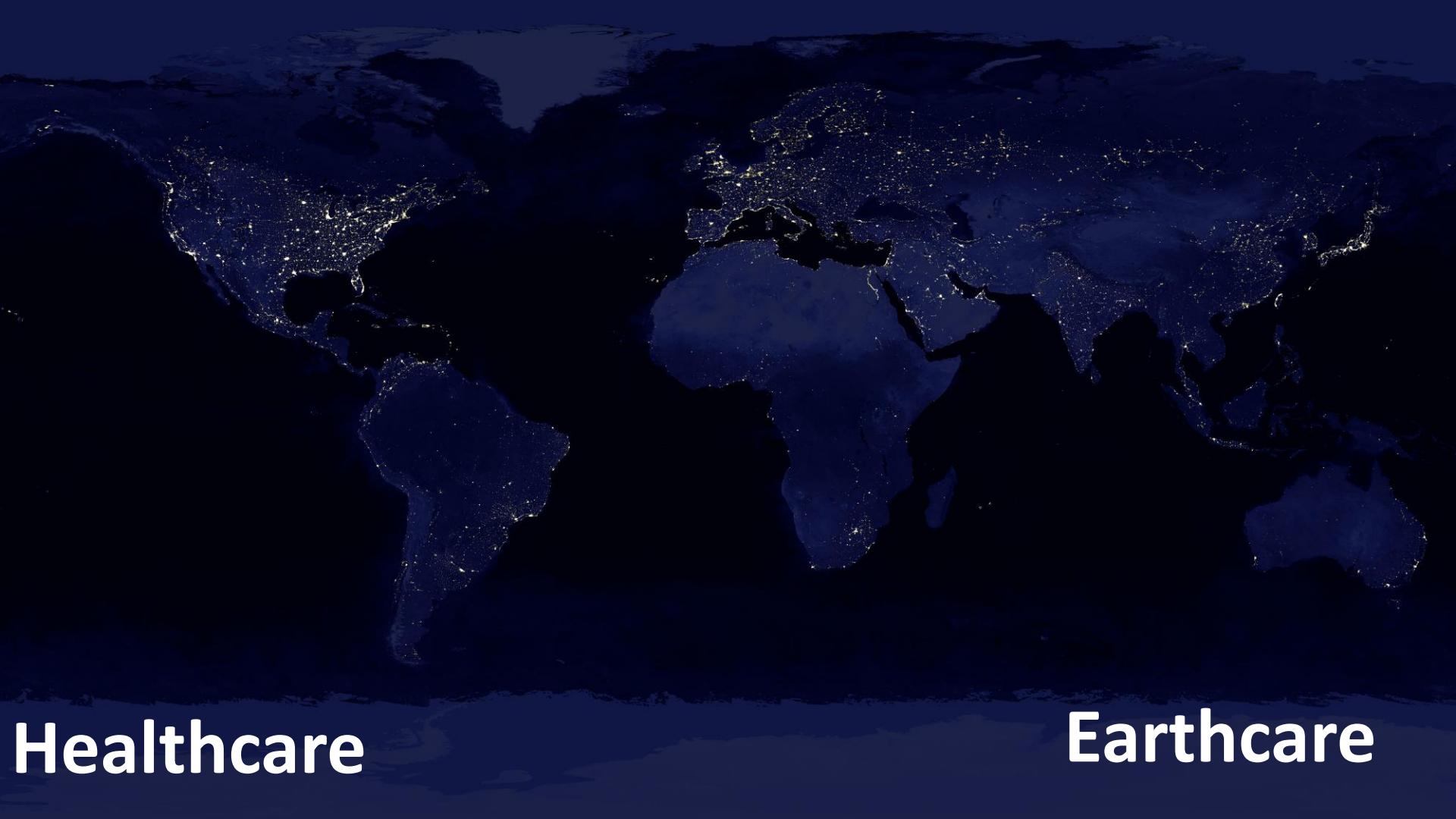
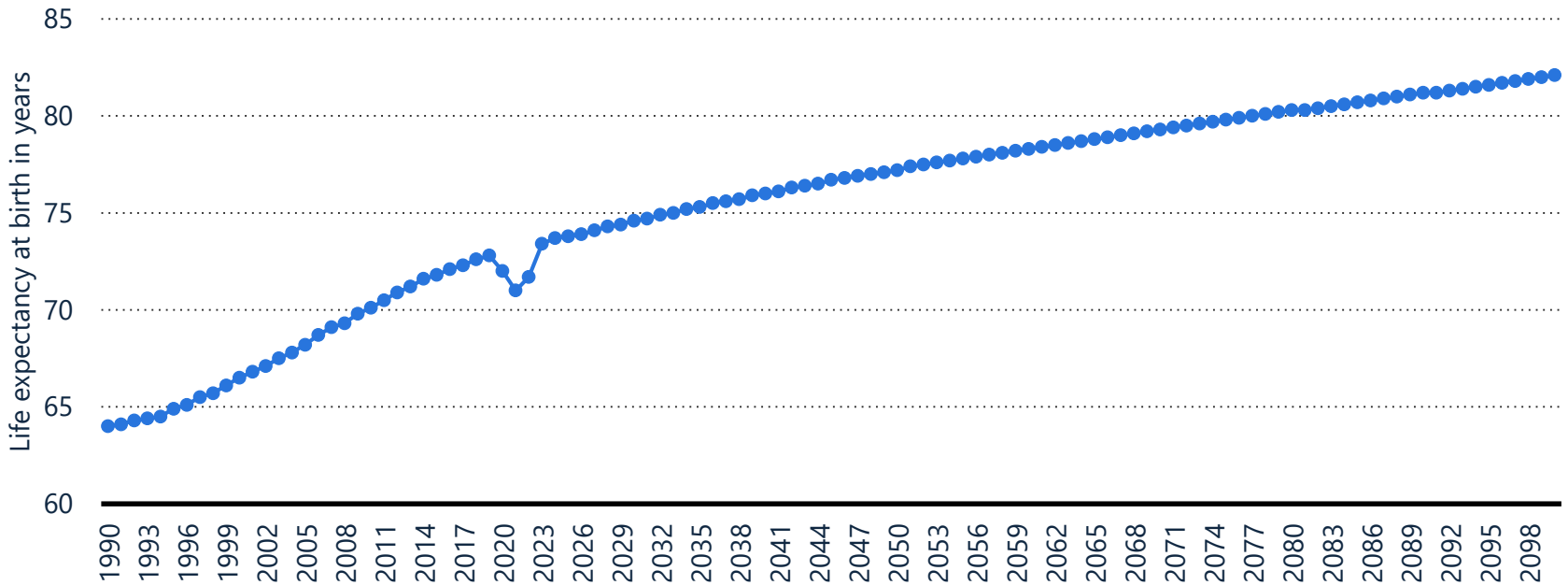
ISTITUTO ITALIANO
DI TECNOLOGIA


Healthcare
Earthcare

Invecchiamento

Projected global life expectancy 1990 to 2100

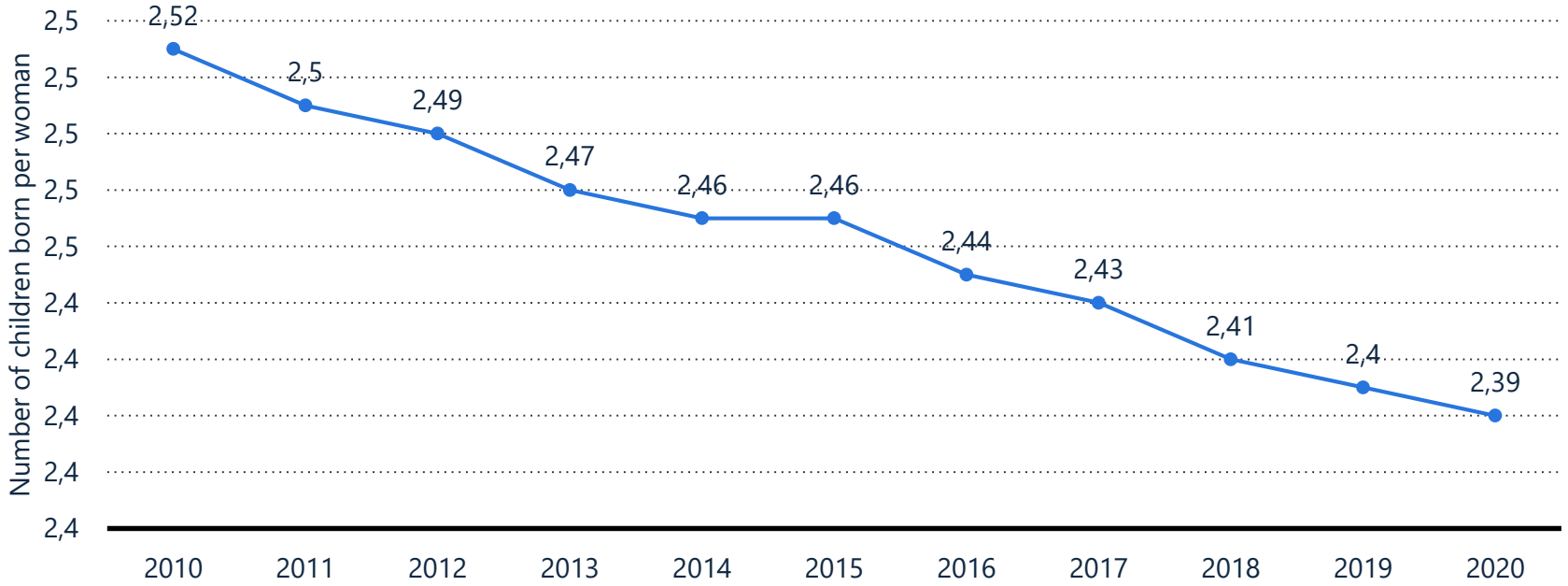
Projected global life expectancy 1990-2100



Description: Global life expectancy increased since 1990 and is expected to continue to increase over the coming decades. Due to the COVID-19 pandemic, there was a fall in the global life expectancy in 2020 and 2021, but it is predicted to continue to increase in the future. In 2019, Europe was the region with the highest life expectancy at birth. Read more
Note(s): Worldwide; 2021; Life expectancy at birth
Source(s): UN DESA

Global fertility rate from 2010 to 2020

Fertility rate worldwide 2020



Description: This statistic shows the fertility rate worldwide from 2010 to 2020. The fertility rate is the average number of children born to one woman while being of child-bearing age. In 2020, the fertility rate worldwide amounted to 2.39 children per woman. Read more
Note(s): Worldwide
Source(s): World Bank

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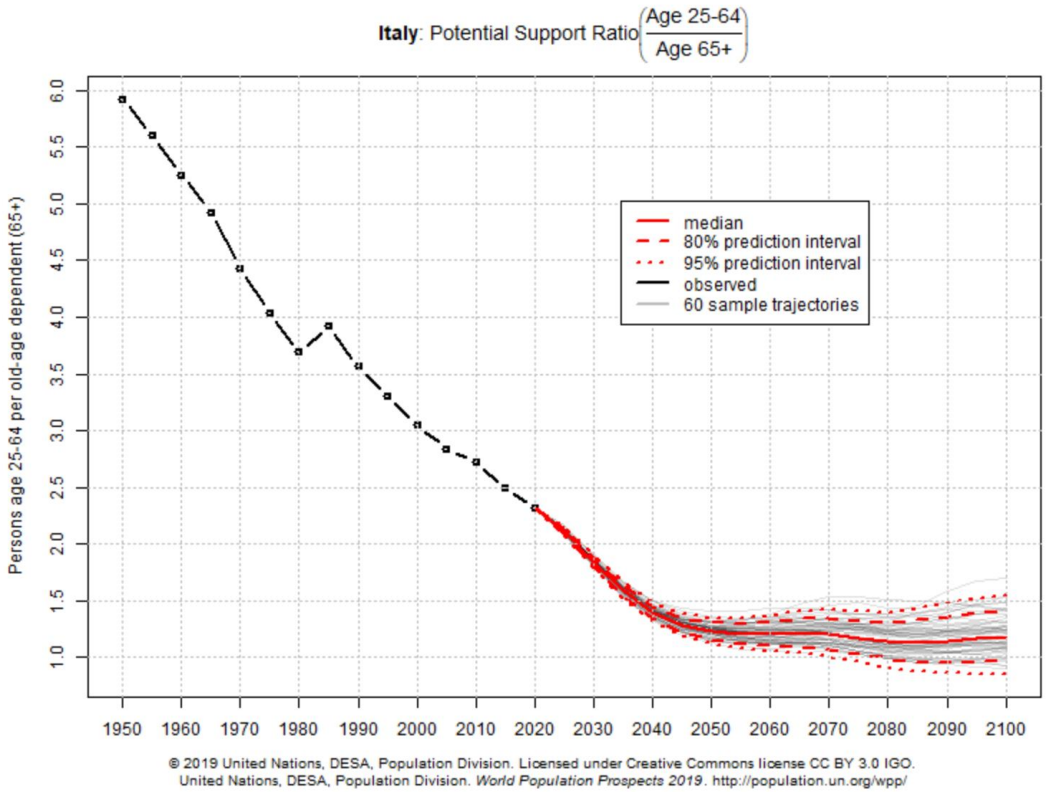
Un mondo che invecchia

- Almeno 35 delle 195 nazioni del pianeta avranno almeno una persona su cinque di età superiore ai 65 anni entro il 2030.
- Nei prossimi due anni, negli Stati Uniti le persone di età pari o superiore a 65 anni eguaglieranno quelle di età inferiore a 18 anni.
- Entro il 2050, una persona su sei nel mondo avrà più di 65 anni, una su quattro in Europa e Nord America.
- Il dato più sorprendente è che si prevede che il numero di persone di età superiore agli 80 anni triplicherà, passando da 143 milioni nel 2019 a 426 milioni nel 2050, rendendo questo gruppo la fascia demografica in più rapida crescita al mondo.

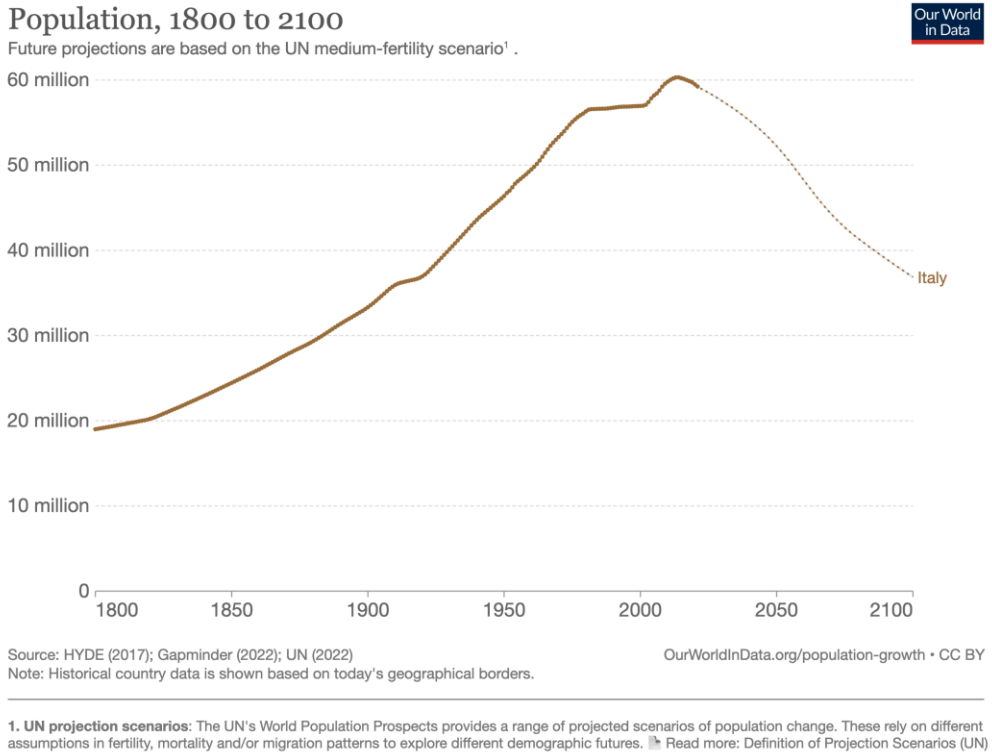
Estratto da La super età di Bradley Schurman

Currently showing: Italy > Probabilistic Projections > Pop Ratios > Potential Support > Age 25-64 by 65 and over



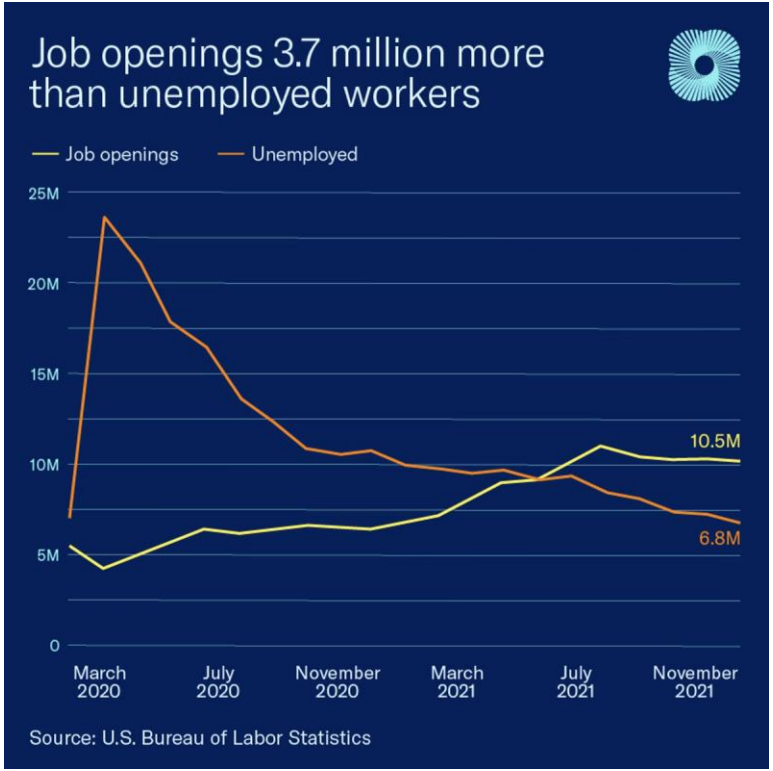
United Nations, DESA, Population Division. *World Population Prospects 2019*. http://population.un.org/wpp/

Quota 36


Population, 1800 to 2100
Future projections are based on the UN medium-fertility scenario[1] .
Our World in Data
60 million
50 million
40 million
30 million
20 million
10 million
0
1800
1850
1900
1950
2000
2050
2100
Italy
Source: HYDE (2017); Gapminder (2022); UN (2022)
Note: Historical country data is shown based on today's geographical borders.
OurWorldInData.org/population-growth • CC BY
1. UN projection scenarios: The UN's World Population Prospects provides a range of projected scenarios of population change. These rely on different assumptions in fertility, mortality and/or migration patterns to explore different demographic futures. Read more: Definition of Projection Scenarios (UN)

Mancano le “mani”:

- La Germania registrerà una carenza di 10 milioni di persone entro il 2030.
- Il Brasile avrà una carenza di 40,9 milioni di persone.
- L'Italia registrerà un deficit di manodopera fino a 0,9 milioni entro il 2030.
- L'eccedenza di manodopera del Canada si trasformerà in un deficit di 2,3 milioni di unità entro il 2030.
- L'eccedenza della Cina si trasformerà in una carenza di 24,5 milioni di persone entro il 2030.



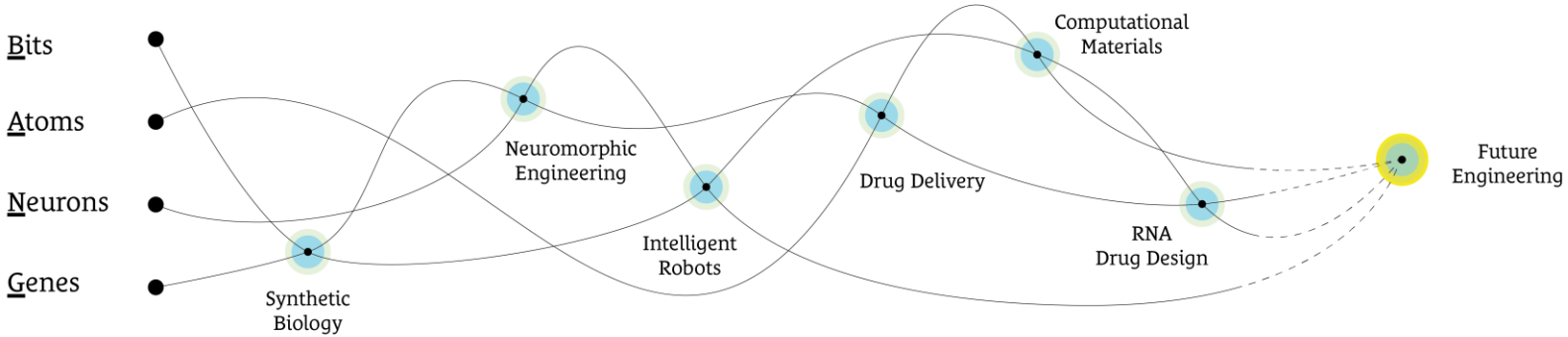
The Global Workforce Crisis $10 Trillion at risk, *Rainer Strack, Jens Baie, Matthew Marchingo, Shailesh Sharda* - **Boston Consulting Group** *2014*

https://www.uschamber.com/workforce/quantifying-the-nations-workforce-crisis-2022-state-of-american-business-update


"DEMOGRAPHIC RISK COULD
COST UP TO $10 TRILLION
IN ECONOMIC VALUE
BY 2030"
BOSTON
CONSULTING
GROUP


Convergenza

Il processo di convergenza tecnologica



IIT’s centers

Centers

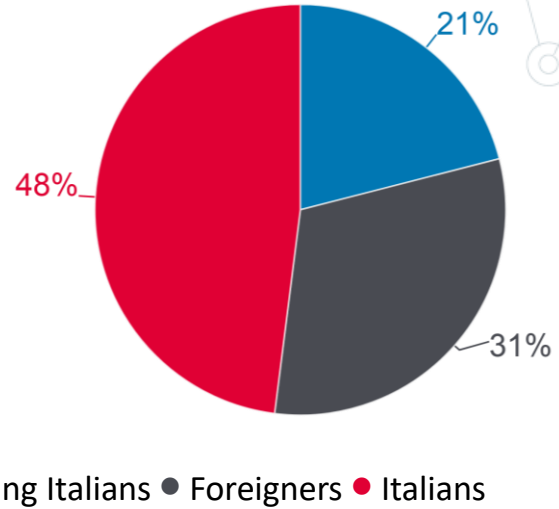
- Center for Neuroscience e Cognitive Science, Università di Trento, TRENTO
- Center for Genomic Science, Campus IFOM-IEO, MILANO
- Center for Nano Science and Technology, Politecnico di Milano, MILANO
- Center for Sustainable Future Technologies, Politecnico di Torino, TORINO
- Center for Translational Neurophysiology, Università di Ferrara, FERRARA
- Center for Material Interfaces, Scuola Superiore Sant’Anna, PISA
- Center for Nanotechnology Innovation, Scuola Normale Superiore, PISA
- Center for Life Nano & Neuroscience, Università degli Studi di Roma La Sapienza, ROMA
- Center for Advanced Biomaterials for Health Care, Università Federico II di Napoli, NAPOLI
- Center for Biomolecular Nanotechnologies, Università del Salento, LECCE
- Center for Cultural Heritage Technology, Università Ca’ Foscari, VENEZIA

Outstations

- IIT@Harvard
  Harvard University, CAMBRIDGE, MA (USA)
- IIT@MIT
  Massachusetts Institute of Technology, CAMBRIDGE, MA (USA)

Multidisciplinarità e Internazionalità

- Oltre 1900 persone
- Età media circa 35 anni
- Ricercatori~80% del totale
- Tenure Track and Tenured positions
- 83 linee di ricerca e 19 Facilities
- Persone da oltre 60 Paesi

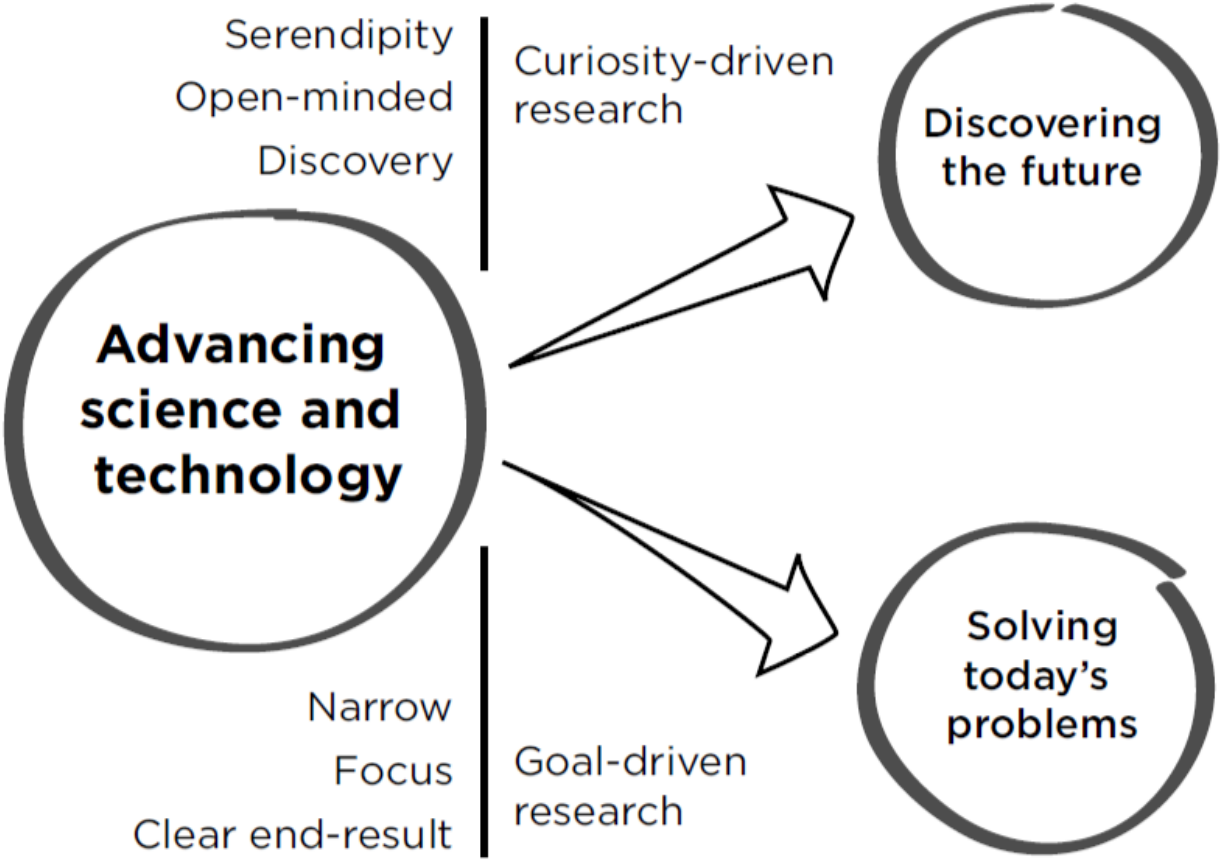


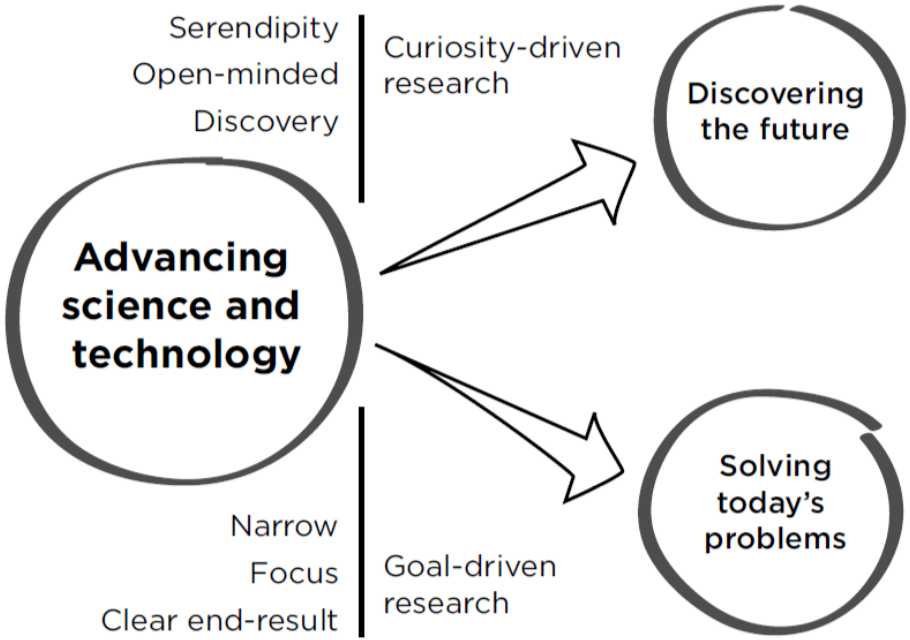
https://iit.it/about-us/facts-and-figures

La scienza di oggi è la tecnologia di domani

L'Istituto Italiano di Tecnologia articola la propria missione statutaria in tre componenti principali, ovvero:

- **Missione di ricerca: realizzare una** scienza eccellente e sviluppare tecnologie all'avanguardia;
- **Missione del trasferimento tecnologico:** applicare la tecnologia per svolgere un ruolo strategico nel settore della ricerca e aiutare la competitività del sistema produttivo italiano;
- **Missione dell'istruzione superiore:** implementare programmi dedicati alla formazione e all'istruzione altamente specializzata.


Serendipity
Open-minded
Discovery
Curiosity-driven research
Discovering the future
Advancing science and technology
Narrow
Focus
Clear end-result
Goal-driven research
Solving today's problems



Blue-Sky Research

Flagship Project


Intelligenza

Un approccio "AI first”

L'accelerazione dei risultati che ci si aspetta dall'**approccio "AI first"** si misurerà con un aumento del tasso di scoperta scientifica, relazioni industriali più stabili e preziose e una migliore qualità della formazione.

ARTIFICIAL INTELLIGENCE

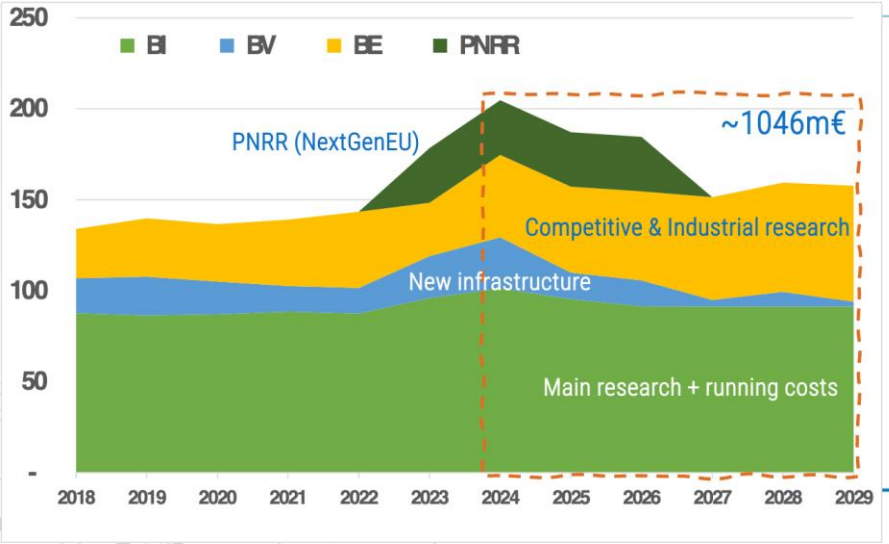
Eric Schmidt: This is how AI will transform the way science gets done

Science is about to become much more exciting—and that will affect us all, argues Google's former CEO.

https://www.technologyreview.com/2023/07/05/1075865/eric-schmidt-ai-will-transform-science/

Oltre 1 Miliardo

Circa 1/3 dell'investimento nella ricerca è dedicato alla scoperta scientifica guidata dalla curiosità
scoperta scientifica

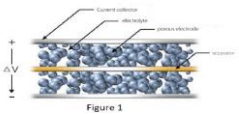


		RESEARCH DOMAINS			
		Robotics	Nanomaterials	Life Technologies	Computational Sciences
CURIOSITY DRIVEN RESEARCH	Blue-sky	VERY HIGH	VERY HIGH	VERY HIGH	VERY HIGH
FLAGSHIP PROGRAMS	Technologies for Sustainability	HIGH	VERY HIGH	MEDIUM	MEDIUM
	Brain and Machines	MEDIUM	LOW	VERY HIGH	MEDIUM
	Teaching Science to Computers	MEDIUM	MEDIUM	MEDIUM	VERY HIGH
	RNA Tech	LOW	MEDIUM	VERY HIGH	MEDIUM
	Technologies for Healthy Living	VERY HIGH	MEDIUM	MEDIUM	MEDIUM

Technologies for Sustainability

Topics

Materials Circularity and Upcycling
Green Robotics
Interconnected Sensors & Systems
Water Remediation & Treatment
Sustainable Energy

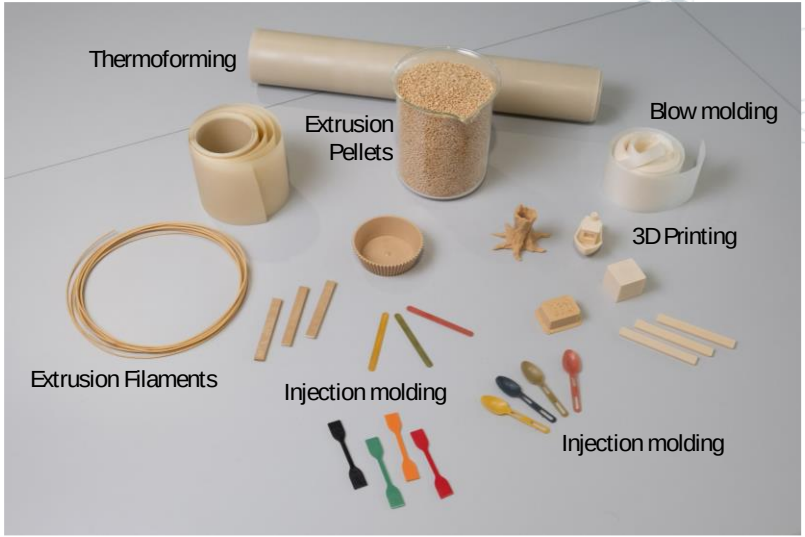


Supercapacitors

Perovskites Solar Cells

Batteries

Exemplar Tech Transfer

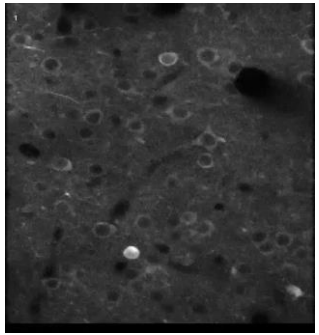


Alkivio™ → TO ALKIPAPER™...

Brain and Machines

Topics

Neuroscience
Robotics
Computational Sciences



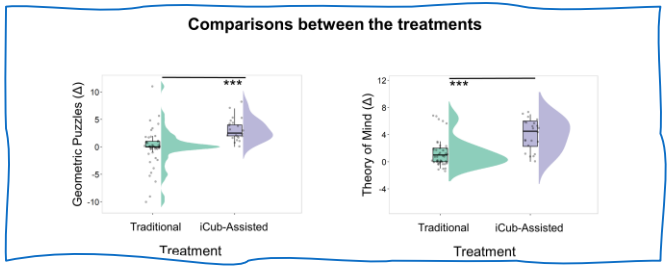
Optogenetics

Collaborative robots

Outcomes

Computational models of human intelligence
More efficient AI algorithms and machines
Healthcare and assistive applications

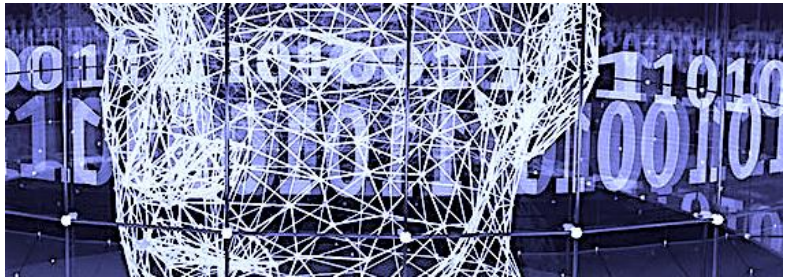
Exemplar Tech Transfer



Teaching Science to Computers

Topics

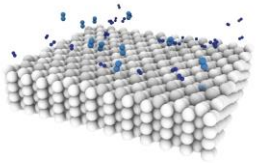
Molecular dynamics simulations
Artificial intelligence
Data science



Outcomes

Physics informed ML
Continual learning
Large scale ML
Trustworthy AI
Multimodal learning

Exemplar Tech Transfer

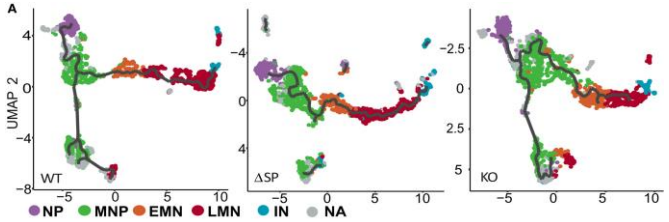


Ammonia → fertilizers: 150 mTons/year, 5% natural gas, 2% world energy production, 5% global CO_2 emission

RNA TECHNOLOGY

Topics

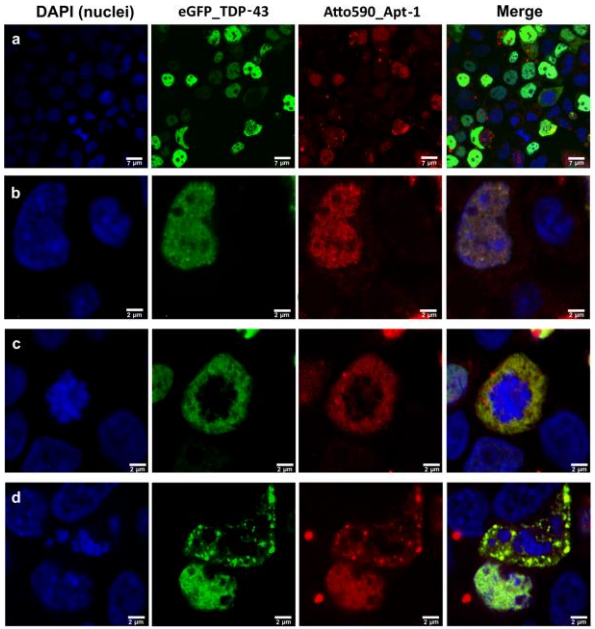
Non-coding RNA function discovery
New technological platforms (e.g. nanopore)
Computational approaches
Imaging
Post-transcriptional modifications and synthesis



Partnerships

National Institute of Molecular Genomics (INGM), Human Technopole (HT), Biotecnopolo in Siena, European Molecular Biology Laboratory (EMBL)

Exemplar Tech Transfer

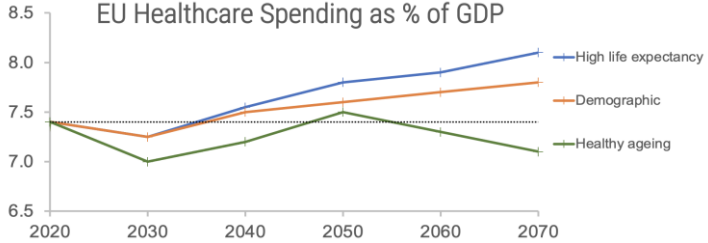


Neurodegenation and ALS
New tool with clinical application (diagnostics)
New patent filed

TECHNOLOGIES FOR HEALTHY LIVING

Topics

Ecosystem of rehabilitation devices
Edible pills for monitoring the digestive system
Activatable nanoparticles for physical-based therapies
Bio-sensors for non-invasive on-site monitoring



Partnerships

INAIL
ISTITUTO NAZIONALE PER L'ASSICURAZIONE CONTRO GLI INFORTUNI SUL LAVORO

BRACCO

GASLINI

fm
FONDAZIONE MONDINO
Istituto Neurologico Nazionale a Carattere Scientifico | IRCCS

Exemplar Tech Transfer

CE certified

REHAB TECHNOLOGIES LAB

Chiara Storchi
Mechatronic engineer

Rehab Technologies

La robotica al servizio dell'essere umano

twin

Float

omnia

Hannes Arm


twin


OCCUPATIONAL
THERAPY
Assistive mode
HUMAN MACH
INTERACTION

omfa

Hannes

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INAIL CENTRO PROTESI

Battery pack

EMG processing board

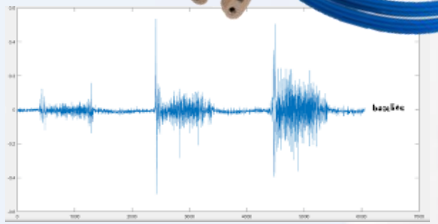
Magnetic plug connector

Motor control board

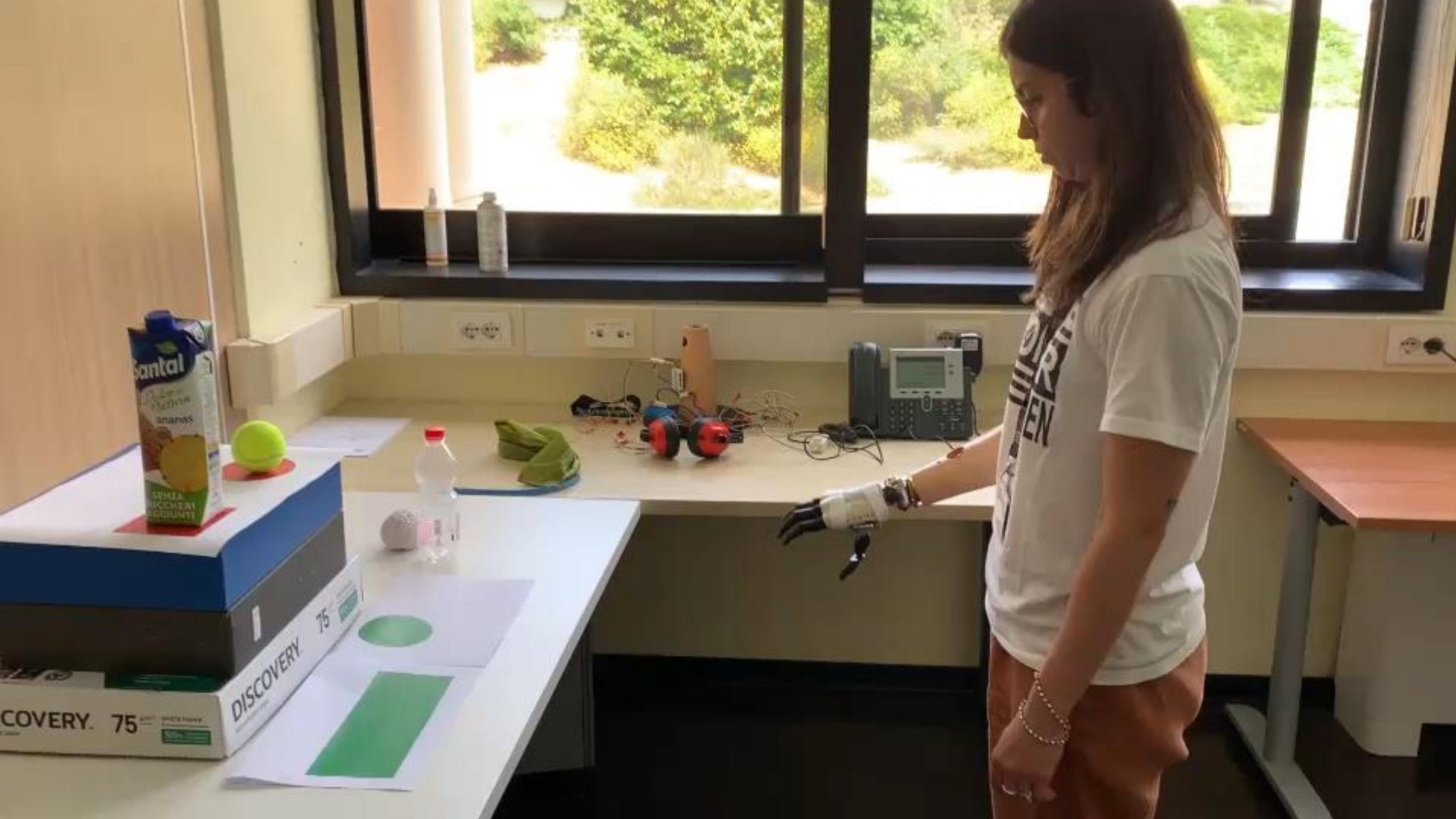
DC motor

Mattery management system

EMG SENSORS




Hannes
Arm


Santal
ananas
DISCOVERY
75

iit RTECH

Conferenza programmatica e di organizzazione

15-16 aprile 2024