CRETANMATTERWAVES

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FOUNDATION FOR RESEARCH AND TECHNOLOGY - HELLAS
Greece

cost
EUROPEAN COOPERATION
IN SCIENCE & TECHNOLOGY

Atom Quantum Technologies

AtomQT.eu

QTSpace.eu

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Mauro Paternostro

ZOOM
27/06/2023

AtomQT.eu

Working groups:

- **WG1 – Break-Through Technologies**
- **WG2 – Atom Technology goes Commercial**
- **WG3 – Quantum Physics and Society**

IMPACT (1): Networks Built

Members of AtomQT:

31 Counties

\+ US (Stanford..)

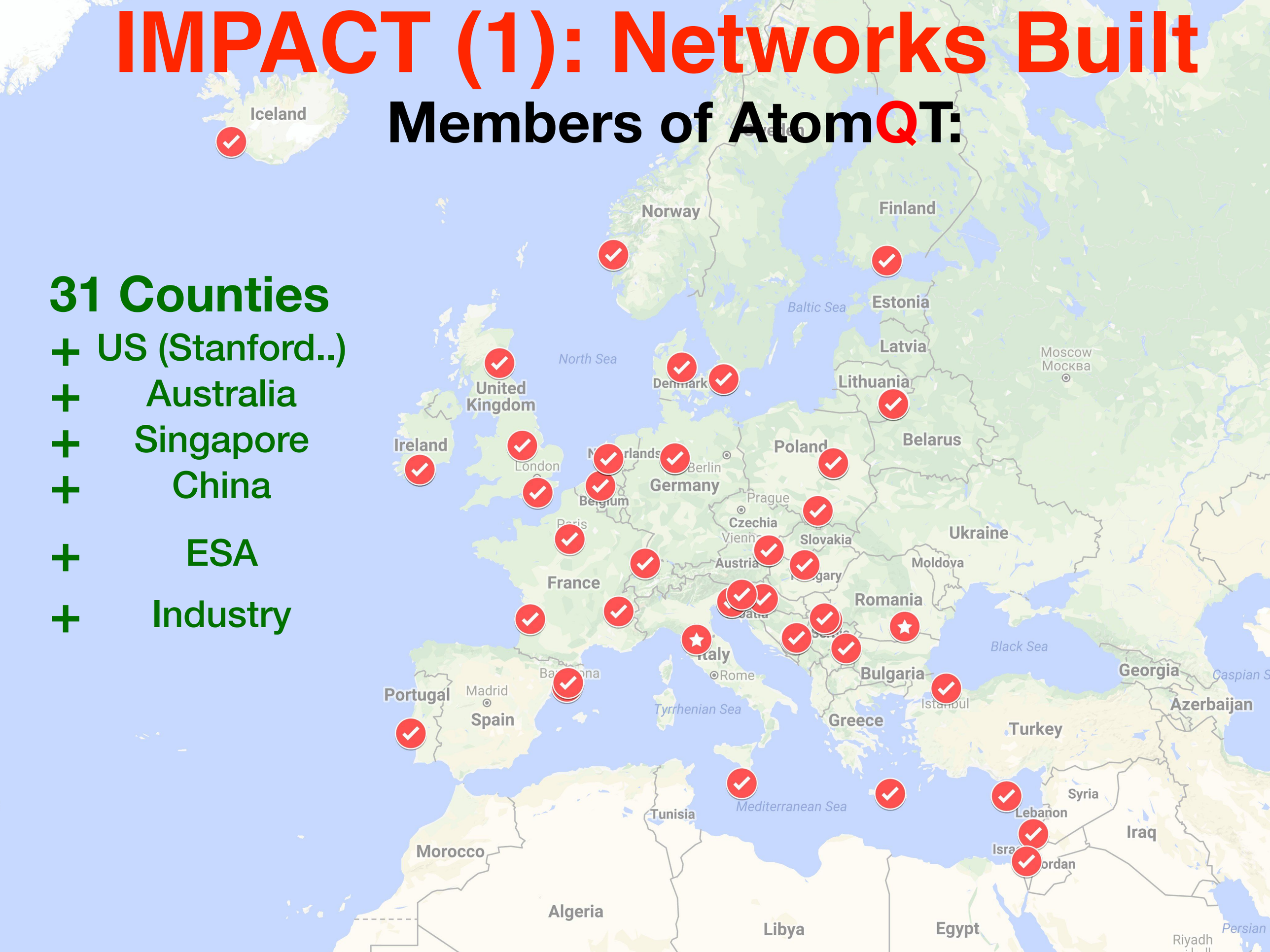
\+ Australia

\+ Singapore

\+ China

\+ ESA

\+ Industry



IMPACT (2): Funding

QUANTUM FLAGSHIP

About Latest information

Sensing & Metrology

Quantum imaging devices can greatly improve imaging technologies.

IMPACT (2): Funding

QUANTUM FLAGSHIP

About Latest information

Sensing & Metrology

ONLY !

Quantum imaging devices can greatly improve imaging technologies.

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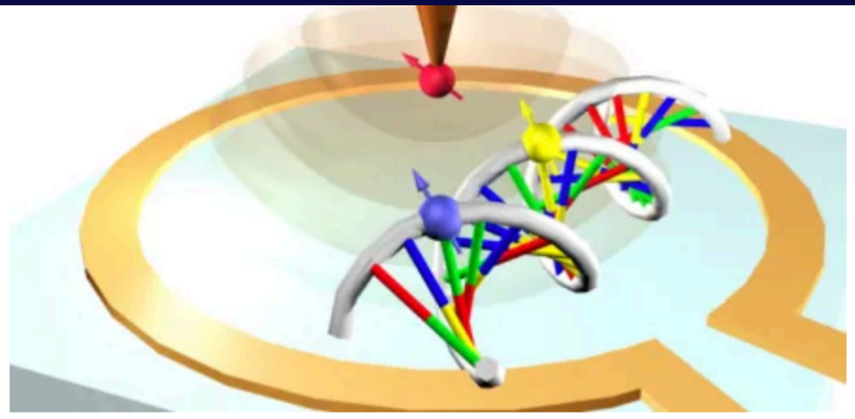
QUANTUM FLAGSHIP

Sensing & Metrology

Quantum imaging devices can greatly improve imaging technologies.

Superconducting quantum interference devices are one example of an early quantum technology now in widespread use, in fields as diverse as brain imaging and particle detection.



Artistic depiction of a spin based quantum sensor for unravelling structure of single biomolecules.

Quantum imaging devices use entangled light to extract more information from light during imaging. This can greatly improve imaging technologies by, for example, allowing higher resolution images through the use of squeezed light or creating the ability to produce an image by measuring one single photon which is entangled with a second, differently colored and entangled photon that is being used to probe a sample. Atomic and molecular interferometer devices use superposition to measure acceleration and rotation very precisely. These acceleration and rotation signals can be processed to enable inertial navigation devices to navigate below ground or within buildings. Such devices can also be used to measure very small changes in gravitational fields, magnetic fields, time or fundamental physical constants.

CARIOQA-PMP: Towards climate studies using quantum technologies

IMPACT (3): Large Actions

Meet the partners

cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

DLR

Leibniz Universität Hannover

DTU Space
National Space Institute

SYRTE l'Observatoire de Paris | PSL
SYstèmes de Référence Temps-Espace

LP2N
Laboratoire Photonique Numérique & Nanosciences

ONERA
THE FRENCH AEROSPACE LAB

LCAR
Laboratoire Collisions Agrégats Réactivité

Technische Universität München

POLITECNICO
MILANO 1863

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Mar 13 – 14, 2023 > CERN

Terrestrial Very-Long-Baseline Atom Interferometry

WORKSHOP

Future IMPACT ?

How is it done?

Collaboration

+ Targeted Efforts

Working Groups…

WG1 Break-Through Technologies

- Leader: **Prof Ernst M. RASEL**
  (University of Hannover, Germany)
- Vice leader: Dr Naceur GAALOUL
  (University of Hannover, Germany)

WG2 Atom Technology goes Commercial

- Leader: **Dr Philippe BOUYER**
  (Institut d'Optique d'Aquitaine, France)
- Vice leader: Prof Barry GARRAWAY
  (University of Sussex, United Kingdom)

WG3 Quantum Physics and Society

- Leader: **Dr Veronica AHUFINGER**
  (Autonomous University of Barcelona, Spain)
- Vice leader: Dr Jordi MOMPART
  (Autonomous University of Barcelona, Spain)

WG3 Quantum Physics and Society

(Veronica AHUFINGER / Jordi MOMPART)

- Interfacing with **policy makers** both **nationally and internationally:**
  - Interact directly with **decision makers at the highest level**
  - Influence policy on quantum-high-tech in Europe and nationally **through reports** (white papers)
- Provide an **Outreach Platform** with a **best practice guide for outreach**.
- Address the geographic **disequilibrium** in quantum-high technology
- Directly attack the **gender imbalance** in the (atom) sciences through **official titles** and through at an **early stage** of education

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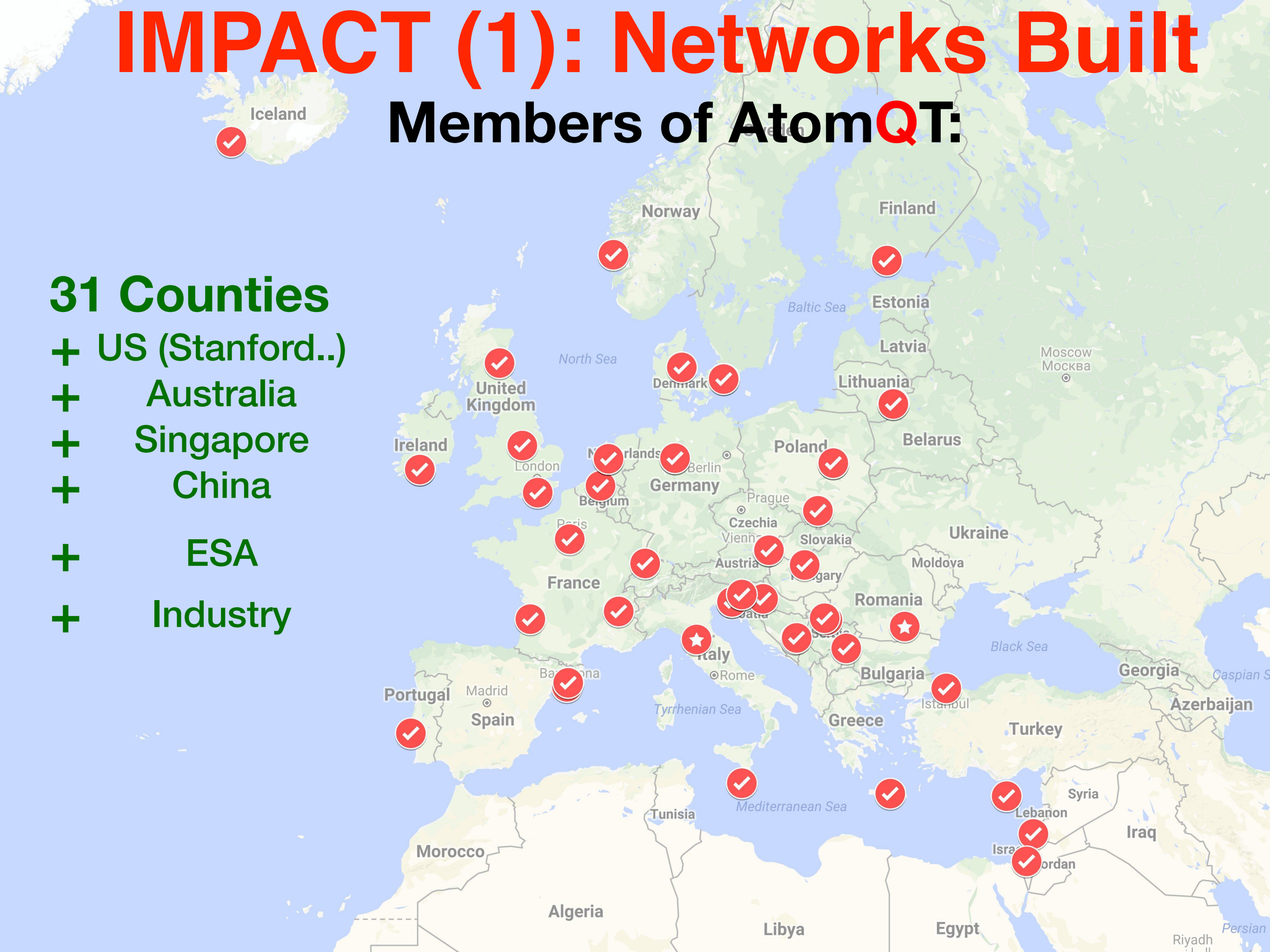

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