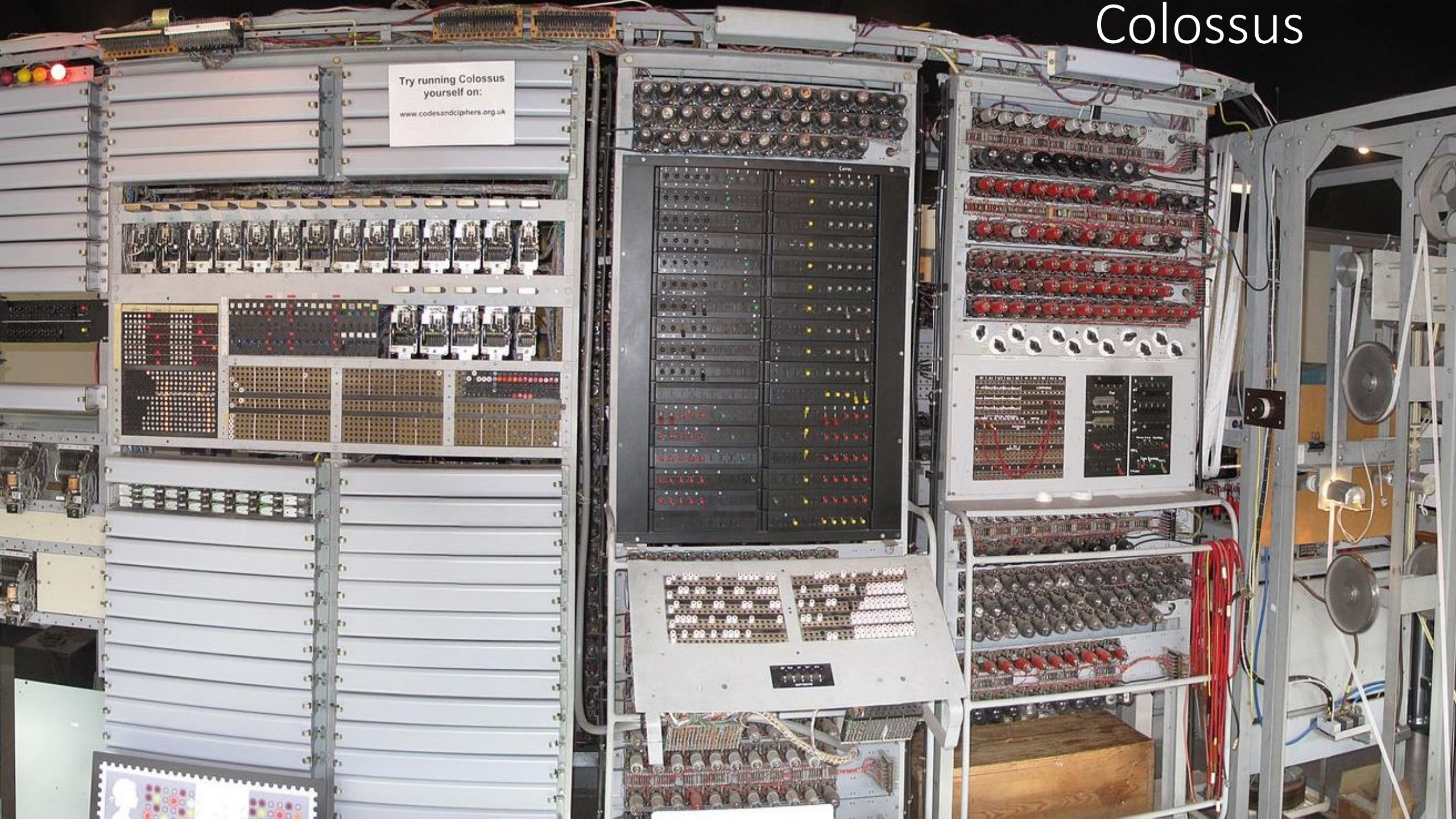
A photograph of a waterfall with several salmon jumping over the falls. The water is white and frothy, and the rocks are dark and wet. The salmon are in various stages of their jump, with some fully in the air and others just entering the water.

TechCARE:  
Creating a Collaborative  
Research And Education  
Environment  
Against All Odds

# Colossus

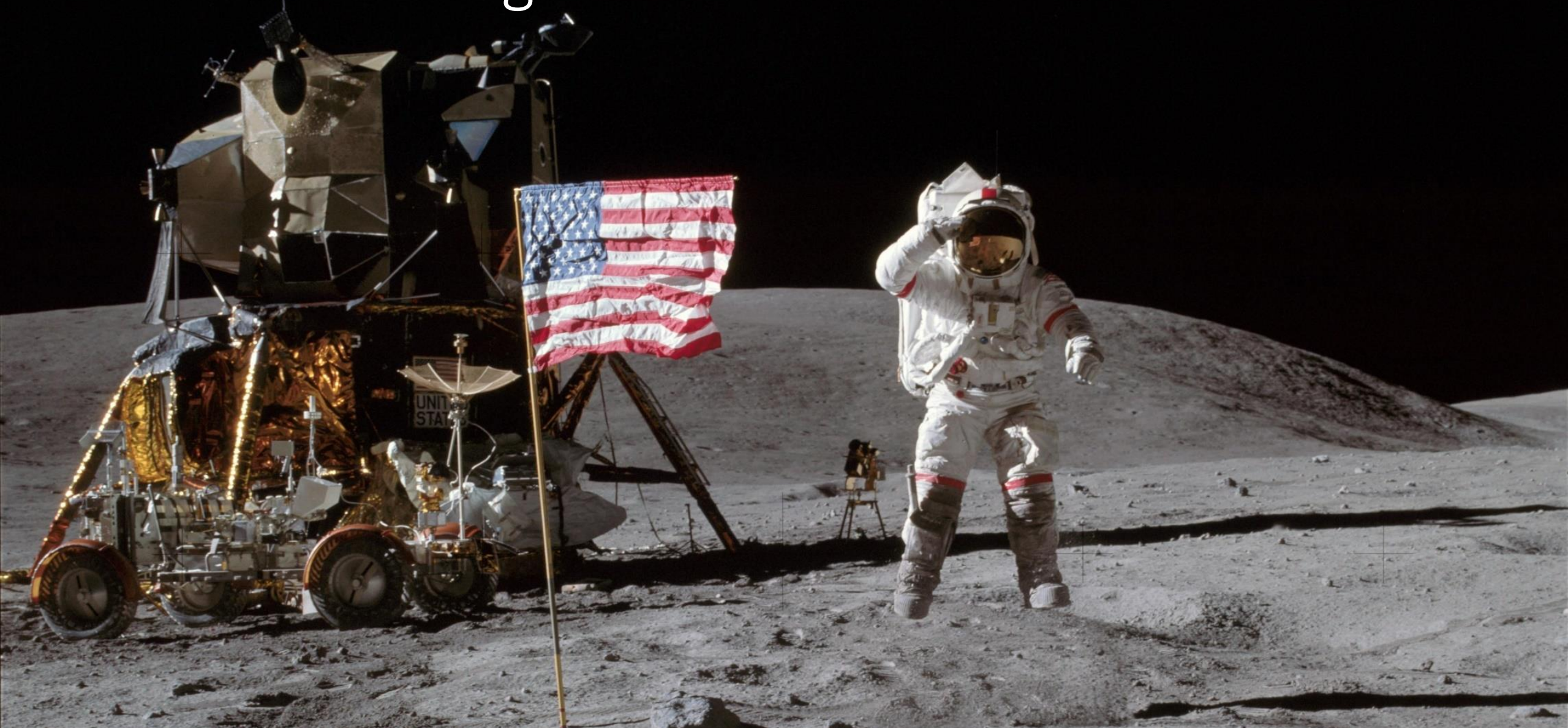
Try running Colossus  
yourself on:  
[www.codesandciphers.org.uk](http://www.codesandciphers.org.uk)

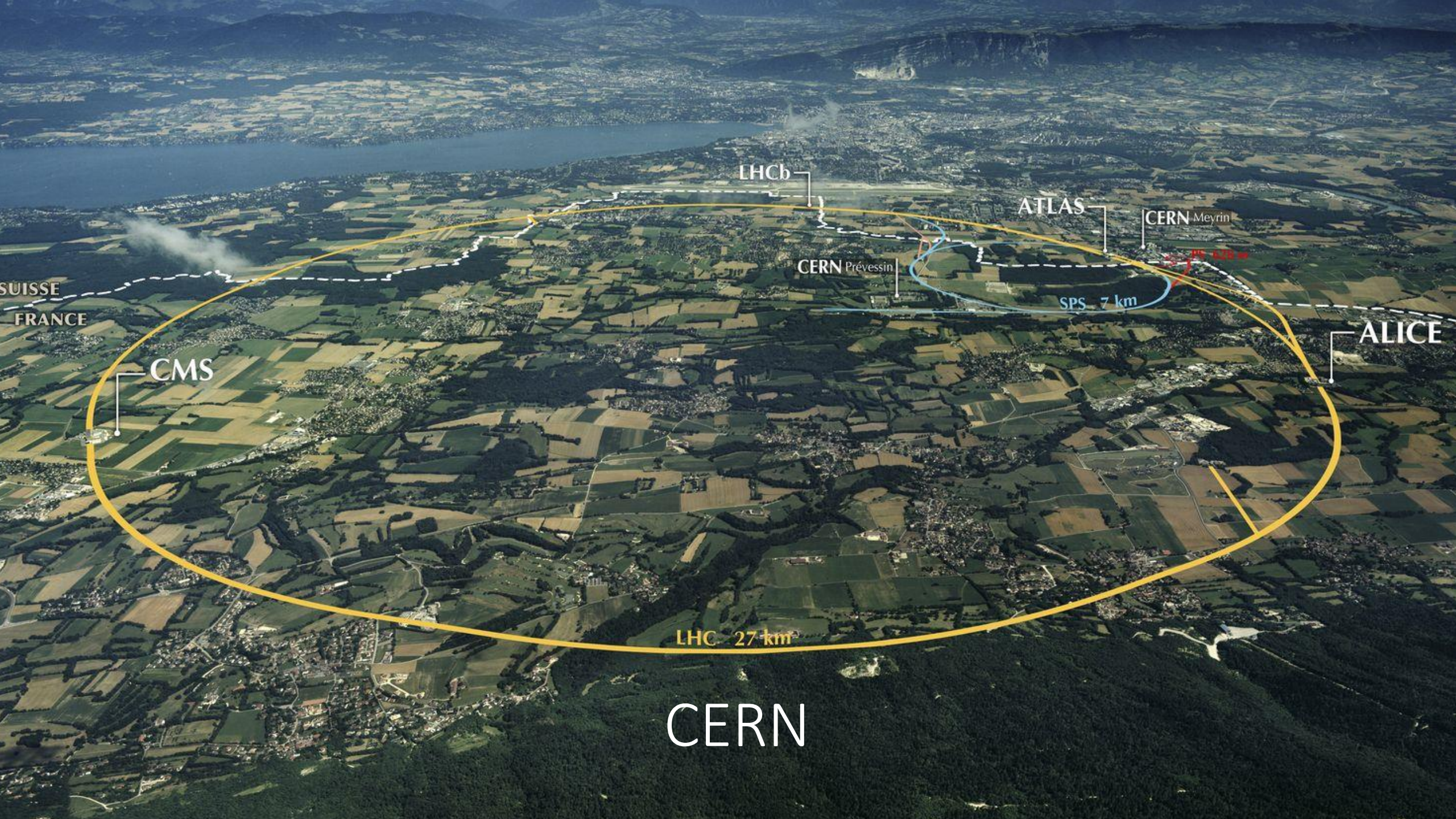


GPS



# Moon Landing





LHCb

ATLAS

CERN Meyrin

CERN Prévessin

SPS 7 km

SUISSE  
FRANCE

CMS

ALICE

LHC 27 km

CERN



The  
Internet

1. Most innovation is driven by a grand challenge



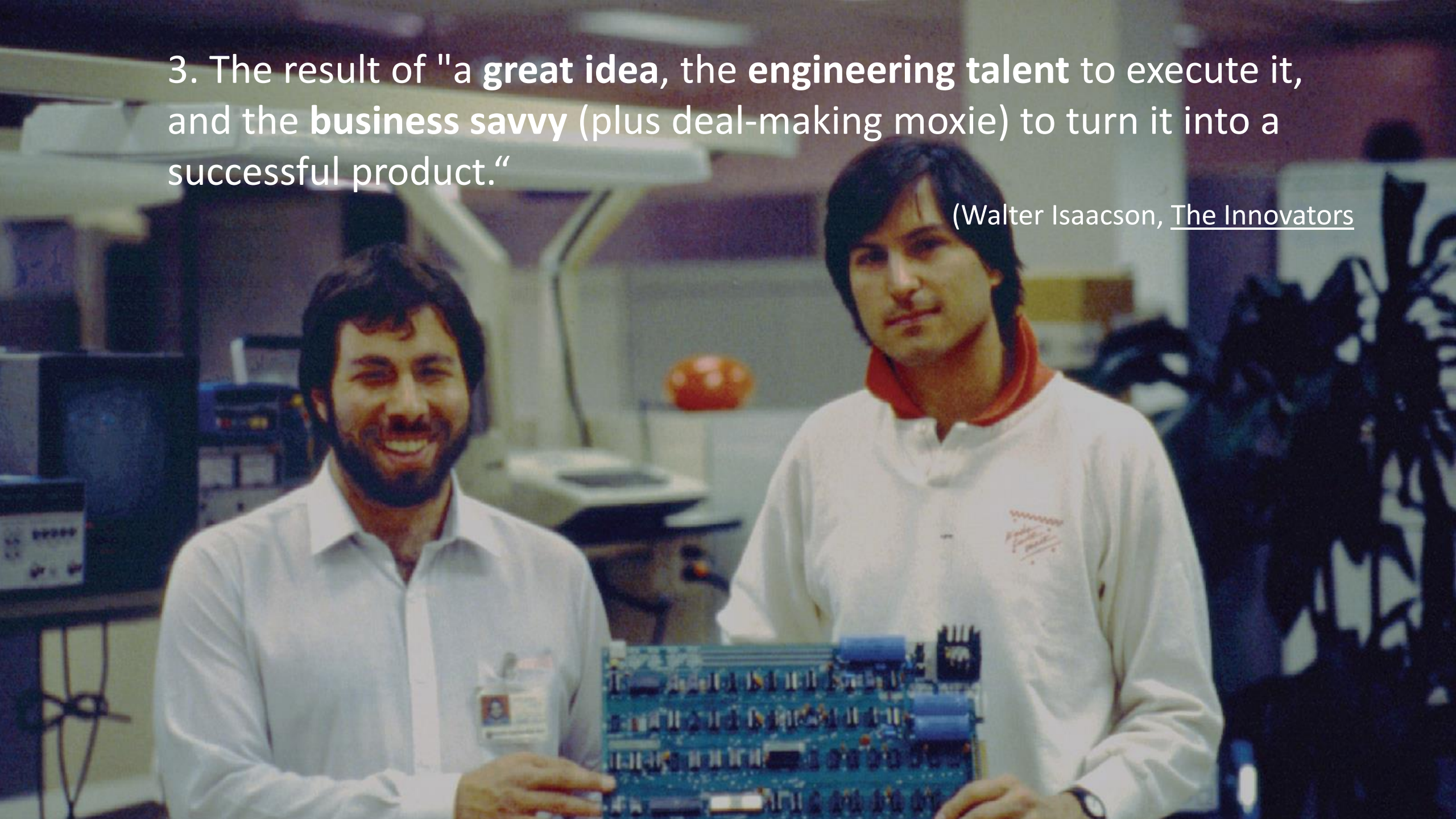
2. Based on the collection of ideas that came before





3. The result of "a **great idea**, the **engineering talent** to execute it, and the **business savvy** (plus deal-making moxie) to turn it into a successful product."

(Walter Isaacson, [The Innovators](#))



# 4. The Result of Cooperation Between Groups of People and Organizations





## 5. Collaborative Funding Models



<b>1</b> NO POVERTY 	<b>2</b> ZERO HUNGER 	<b>3</b> GOOD HEALTH AND WELL-BEING 	<b>4</b> QUALITY EDUCATION 	<b>5</b> GENDER EQUALITY 	<b>6</b> CLEAN WATER AND SANITATION 
<b>7</b> AFFORDABLE AND CLEAN ENERGY 	<b>8</b> DECENT WORK AND ECONOMIC GROWTH 	<b>9</b> INDUSTRY, INNOVATION AND INFRASTRUCTURE 	<b>10</b> REDUCED INEQUALITIES 	<b>11</b> SUSTAINABLE CITIES AND COMMUNITIES 	<b>12</b> RESPONSIBLE CONSUMPTION AND PRODUCTION 
<b>13</b> CLIMATE ACTION 	<b>14</b> LIFE BELOW WATER 	<b>15</b> LIFE ON LAND 	<b>16</b> PEACE, JUSTICE AND STRONG INSTITUTIONS 	<b>17</b> PARTNERSHIPS FOR THE GOALS 	<b>SUSTAINABLE DEVELOPMENT GOALS</b> 



If I have seen further it is only by standing on the shoulders of giants.

Sir Isaac Newton



We have many efforts to support innovation ...





... but we need to encourage collaboration

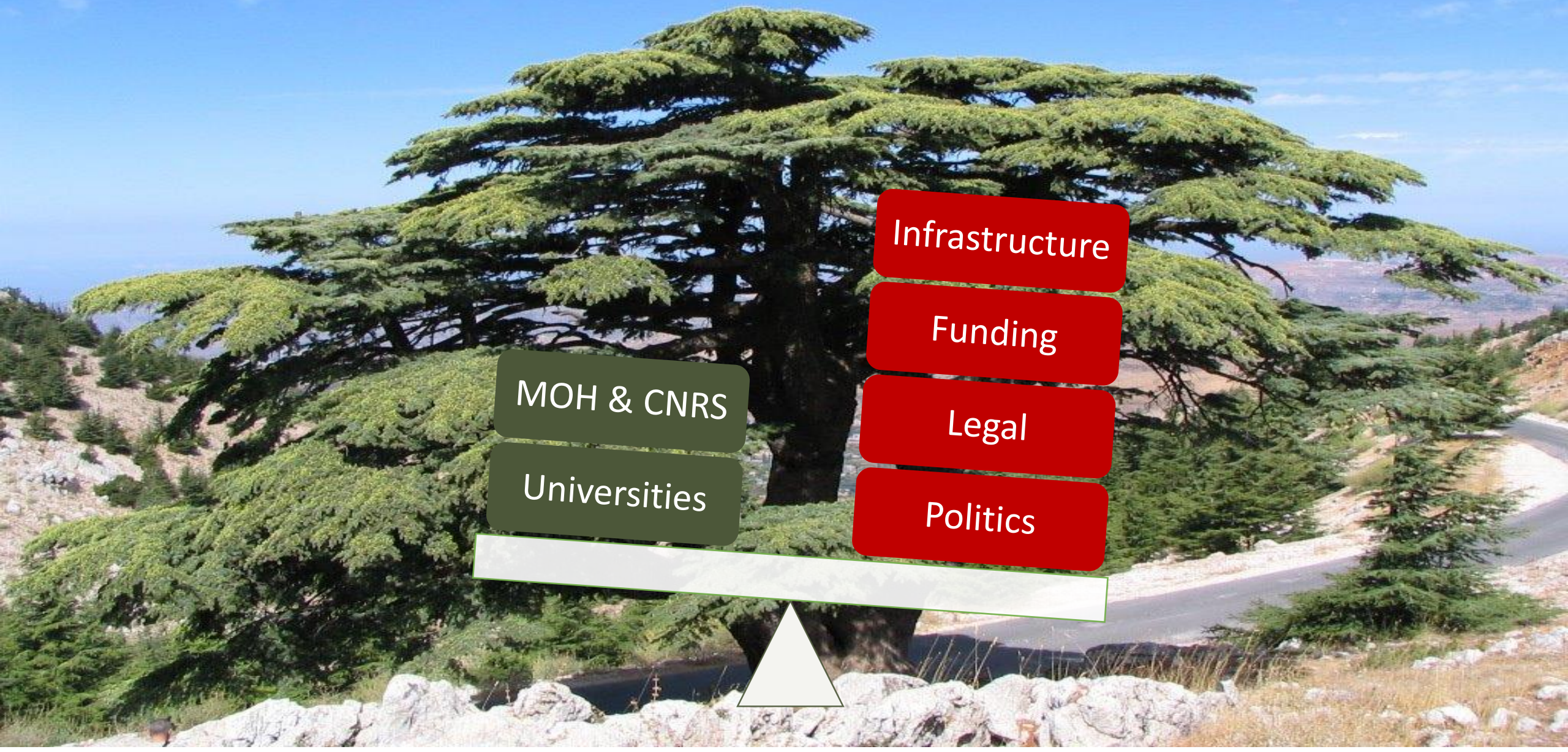


... so we set out to create a Lebanese National Research and Education Network (NREN) ...

- A research collaboration platform
- Contribute to Technology/Service development
- Participate in global/regional connectivity initiatives
- Bring benefits of collective buying power by procuring networks and services on a national basis



Lebanon tried to build an NREN in 2011 ...



Infrastructure

Funding

Legal

Politics

MOH & CNRS

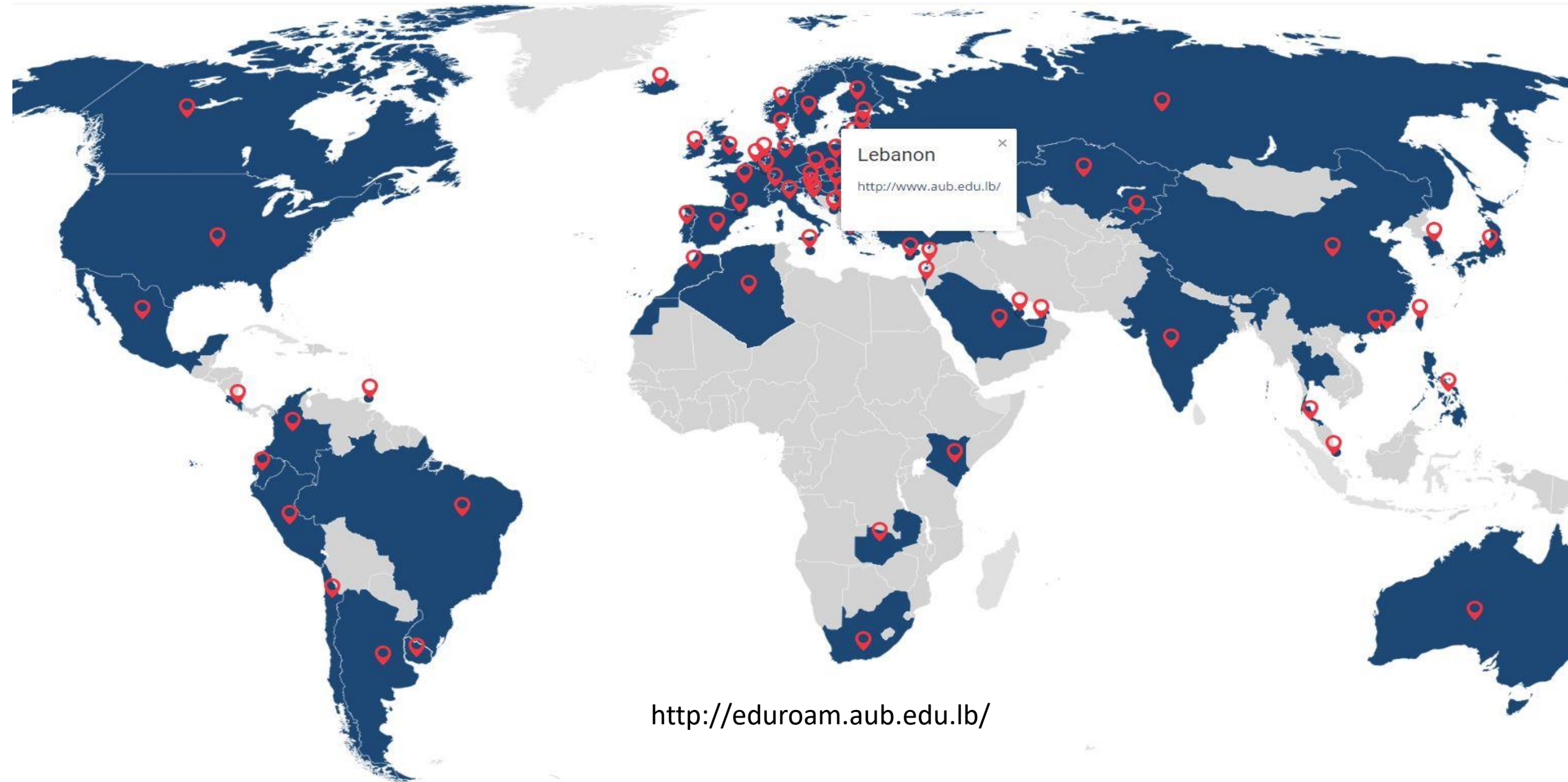
Universities

# NREN

Instead of focusing on building a network, we decided to start by building a **collaborative community** and **services** that to meet our research and education needs

“When life gives you lemons, make lemonade!”

We started with  for AUB



<http://eduroam.aub.edu.lb/>

We then connected AUB to



&

ASREN



Africa  
Connect 2

EUMED  
connect 3

... and developed **TechCARE**

a

**T**ech  
**C**ollaboration  
**A**greement for  
**R**esearch and  
**E**ducation

...to address legal  
and funding challenges

### Governance

- One member one vote
- New members accepted by majority


### Services


- Optional
- Led by volunteer institution

### Funding

- Mandatory fees
- Cover “base services”




  
Signed on Behalf of  
American University of Beirut

  
Signed on Behalf of  
Beirut Arab University



  
Signed on Behalf of  
Holy Spirit University of Kaslik

  
Signed on Behalf of  
Lebanese American University



  
Signed on Behalf of  
Saint-Joseph University of Beirut

5 universities  
immediately  
signed up

We have since developed several NREN services ...

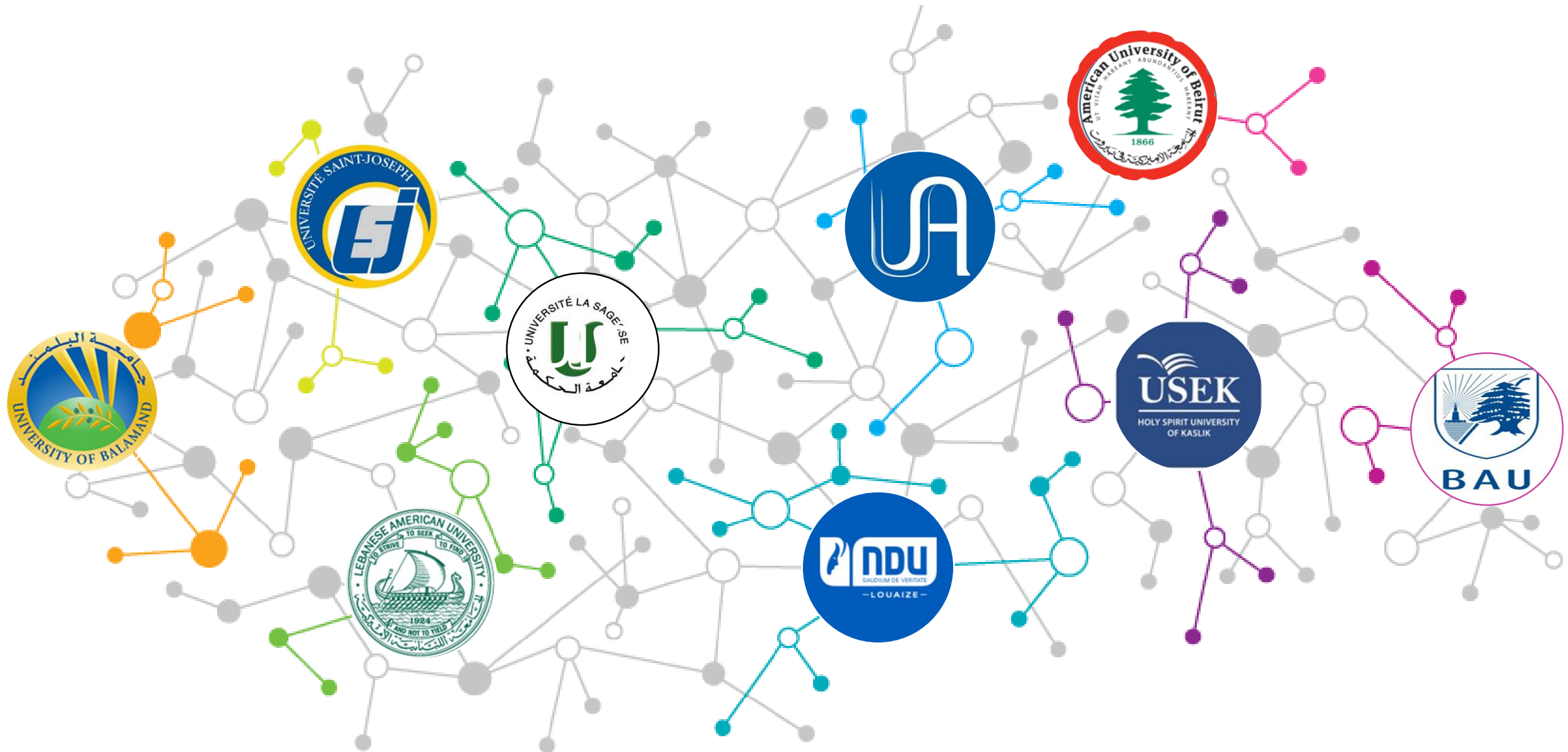


5  
GBPS



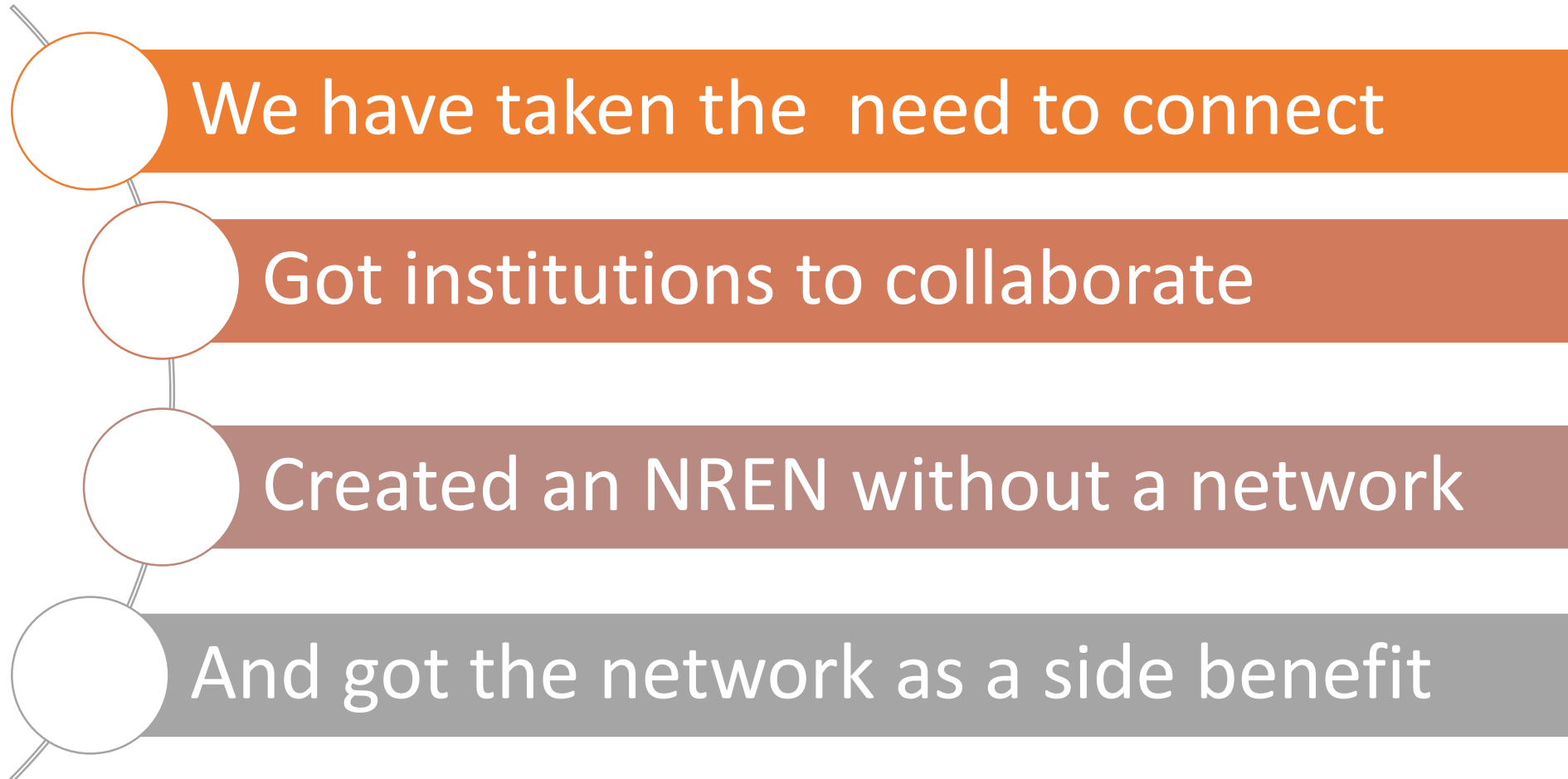
- Connection to GEANT, ASREN and other NRENS
- Eduroam
- Federated services infrastructure
- Unlimited certificates
- A national network backbone
- Developing centers of excellence

... and grown the network to 9 universities






# By focusing on the services instead of the network...



... we got an NREN for free!



... making it easier to provide  
innovative research and education  
services ...

- EduRoam
- Federated services
- Expanded international connectivity
- HPC and specialized computing
- Cloud services
- Smart campuses



**IT IS AMAZING WHAT YOU  
CAN ACCOMPLISH IF YOU  
DO NOT CARE WHO GETS  
THE CREDIT.**

*( Harry S Truman said )*



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American University of Beirut

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