### Science Without Borders

Vincent Rivasseau Laboratoire de Physique Théorique Paris-Sud University Orsay, The European Union

OIST, Okinawa, July 23 2019

According to *Nature*, in 2019 OIST was among the top ten institutions world-wide punching above their weight in producing high-quality research



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# 10. Okinawa Institute of Science and Technology Graduate University

Fractional count: 29.08, Article count: 62, Nature Index rank: 361

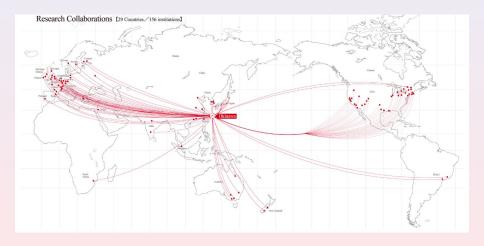
The Okinawa Institute of Science and Technology Graduate University (OIST) is one of the most diverse institutions in Japan, with half of its faculty members coming from other countries. The graduate-only university is among the leading institutions based on its normalized fractional count, with the physical sciences and life sciences being the largest contributors to OIST's overall output.

Unlike other Japanese institutions, almost all of OIST's courses and research activities are carried out in English. The university also has no departments, instead, researchers from different areas share facilities, equipment and resources. Among the facilities are a sample-preparation robot, a solar- and wind-powered house for research on sustainable living, and an advanced lab dedicated to oceanography.

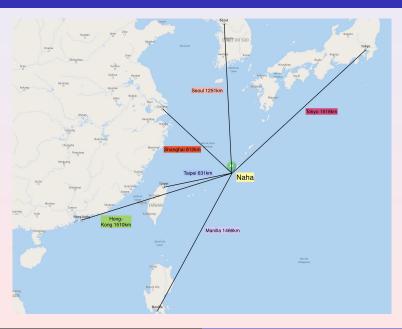
# The students of OIST



# Research Colaborations at OIST



# Geography



# The elephant in the room



China...

# The elephant in the room



China...



In southern France we are currently building the first fusion tokamak, ITER



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China, the European Union, India, Japan, Corea, Russia and the United States share their resources to build this machine together



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#### The iron curtain



Another interesting example: the Schrödinger institute in Vienna

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# My advice

# So my wishes for a creative future at OIST:

- Even more of China
- and a bit of Africa...

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Let me invite you all now to a far away and exotic place, Western Africa



## Nationalist heritage in Africa



This is the map of Senegal and Gambia

### Nationalist heritage in Africa



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# What about nations as resource managers?

More than 80% of the electricity in Sénégal is generated by fossil-fuel



The Senegalese coal power plant in Sendou

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### Nations and resource management

About 65 % of Germany's electricity comes from renewable sources



A solar power plant in Germany

## Nations and resource management

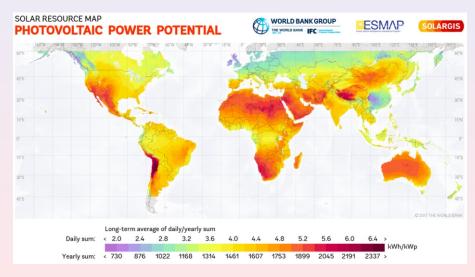
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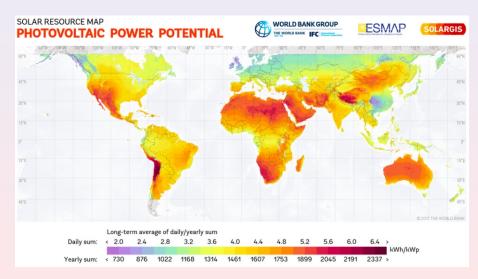
A solar power plant in Germany

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## Solar Power by Potential

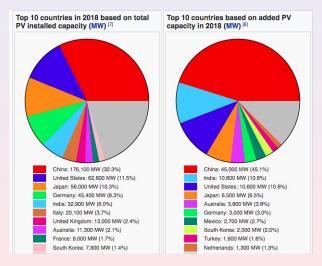


Chile, Africa, Middle East, Tibet...

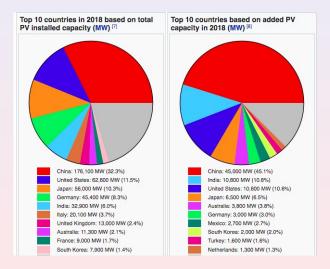


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### **Solar Power by Countries**



None is African



None is African!

#### **AIMS**

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- I became a fan of his African Institute for Mathematical Sciences
- It was innovative, panafrican, multilingual, gender sensitive... everything
- After a few years teaching at the first institute in Muizenberg near Cape
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#### AIMS-Sénégal

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#### Science a universal endeavour

The success of AIMS is another proof that science, like music, is universal.



$$F(1,...,1) = \sum_{\mathcal{F}} \left\{ \prod_{\ell \in \mathcal{F}} \left[ \int_{0}^{1} dw_{\ell} \right] \right\} \left\{ \prod_{\ell \in \mathcal{F}} \frac{\partial}{\partial x_{\ell}} F \right\} \left[ x^{\mathcal{F}} (\{w\}) \right]$$

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- I think that science should ally with ecology against nationalism and fundamentalism in order to sustain mankind at the ten billion level

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- Physicists know the critical importance of scale
- Mankind: 10 billion, 200 nations, 10-100 religions...
- Average size nation/religion: 50-100 million
- ullet Largest empires, nations or religions  $\simeq 1$  billion
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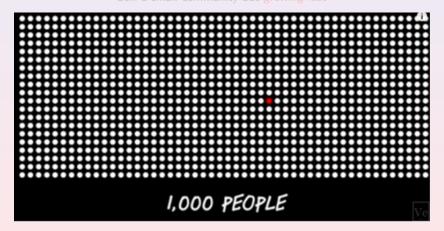
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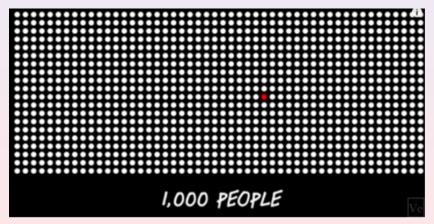
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Each of us should engage with 999 people.

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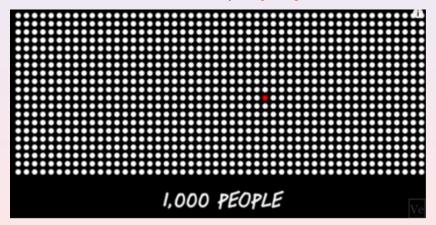
Still a small community but growing fast



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## Our responsibilities

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- Science also allowed nuclear weapons
- We cannot evade this world nor our responsibilities
- The main curse of our human family is its bitter division into quarreling nations and religions

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## Nations can wage wars

I think nations are mankind's worst invention, because they plan and wage wars



During the last century these wars became insane

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"Civilized" nations organized crime and cruelty on a scale never seen before especially when supported by nationalist ideologies

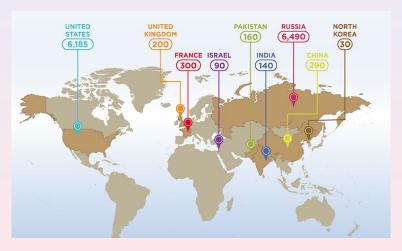
#### Nations have committed the worst historical crimes



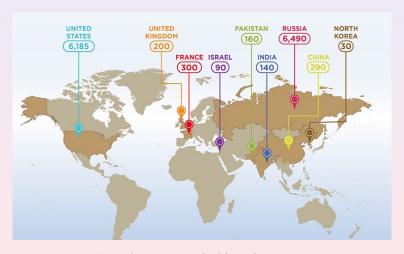
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 $\simeq 10$  nations are armed with nuclear weapons



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## Can we trust them for our survival?



You bet...

## Scientists as accomplices



Scientists, most of the time, prefer their nation to the interests of mankind

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#### A modest reaction



The failure of nations was so epic that in the second half of the XXth century it led to some modest attempts to rein them through international institutions

Alas these institutions did not live up to the great hopes they generated



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## May be regional steps first?



Regional/continental initiatives have been on average more successful. The best example is the European Union (2012 Peace Nobel prize)

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#### **Brexit**

Today the European Union, the impossible dream of our grand-fathers in their trenches, so painfully built by our fathers, is under relentless attack



The Brexit fresco in Dover (UK)

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Nationalism has taken a more sinister twist, which I call national-populism



It is a global pandemic, spread from the most powerful lectern in the world

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## The pandemy progresses







This year alone at least three new victims: Brazil, Italy and UK...

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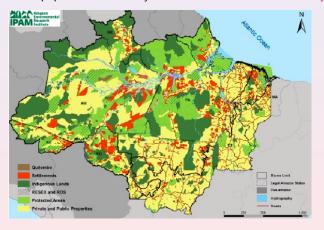


British MP Jo Cox, murdered by a Brexit fanatic on June 16 2016



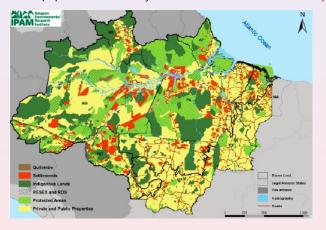
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## National-populists have clearly identified science as their ennemy



The Amazon deforestation map in Brazil

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## The national-populist discourse



The Amazon belongs to Brazil and European countries can mind their own business because they have already destroyed their own environment, said Brazil's far-right president Jair Bolsonaro, who also described his own government's satellite data showing an alarming rise in deforestation as "lies". He also said he was "fulfilling a mission from God", defended his decision to name his own son as Brazil's ambassador to the US and described Brexit as "the will of the people", although he admitted he had never heard of the UK's likely next prime minister, Boris Johnson. (The Guardian, July 19)

## The national-populist discourse



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## No nation seems immune



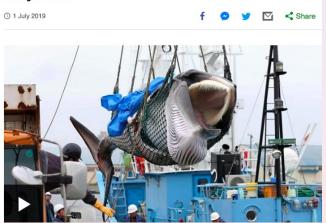
In France our local brand, the "National front" is making regular electoral progress

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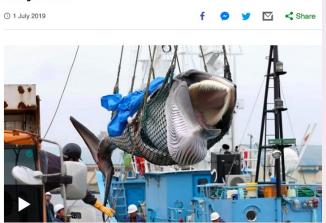
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# Japan resumes commercial whaling after 30 years



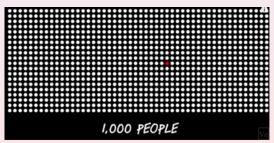
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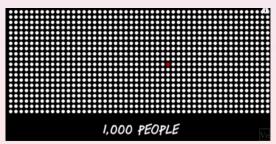


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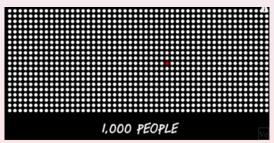
- We scientists cannot stay neutral in the defining fight of our time
- Many of us already engage in local actions. We could better coordinate our efforts at world-wide level. See what Amnesty international has accomplished for human rights, or Greenpeace for ecology
- We need to engage this fight with a compassionate heart which cannot come from science alone



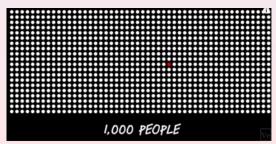
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"Leave No One Behind" is the motto of the US Marines



## A Motto for Scientists as Marines of the planet?



Save Them All!

## Most of the time nationalist parties govern most countries and the most powerful ones, China, India, Russia and the United States

Democracy is obviously better than dictatorship but alone is not enough because it is only practiced at single-nation level

The Unites States for instance is a democracy which exerts dominant economic, cultural and military influence over more than 50% of the world population, but its government is elected by only 3% of this population

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