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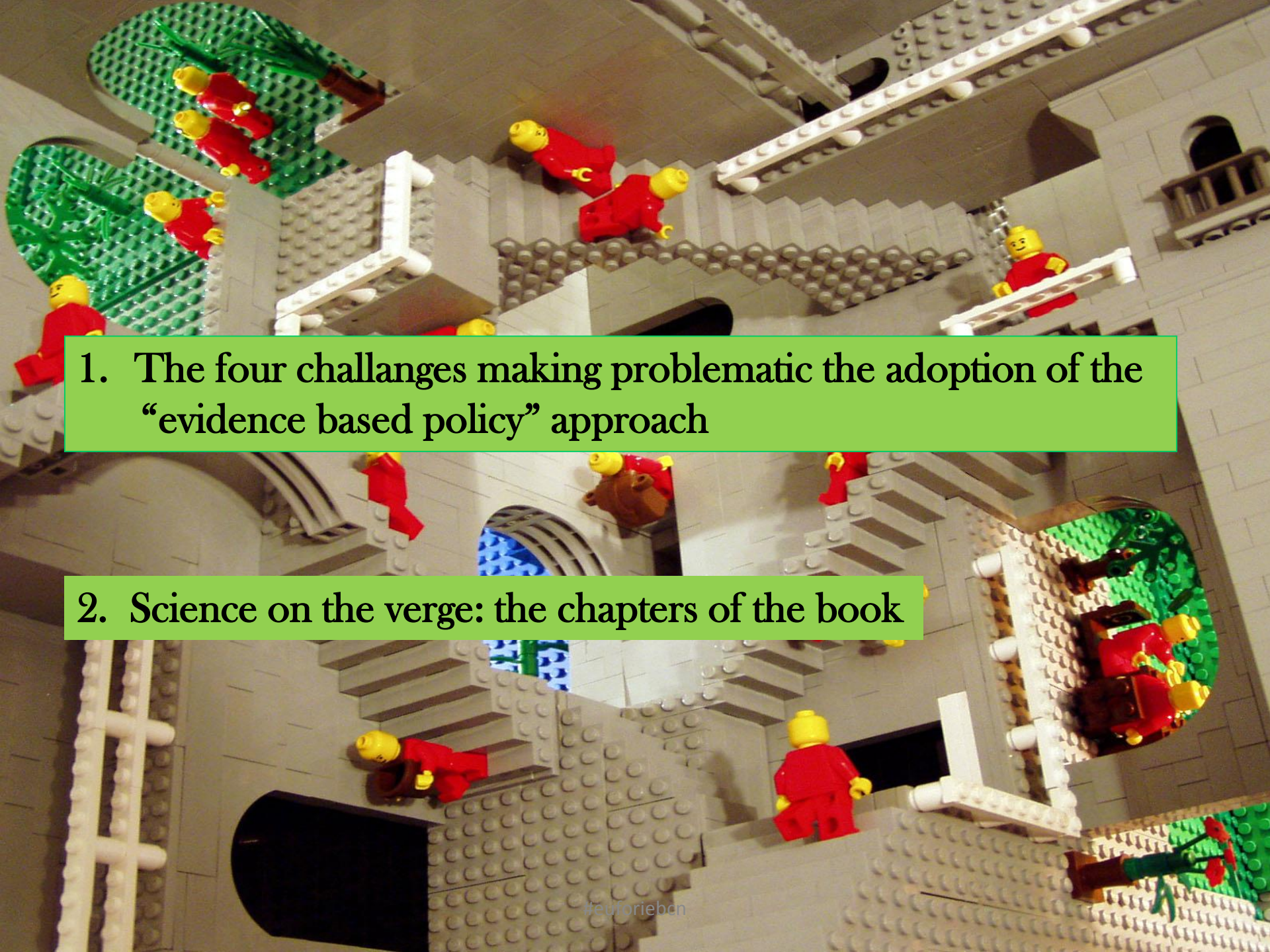
icta Institute of Environmental Science and Technology • UAB
Research Group on Integrated Assessment

The rightful place of science: science on the verge (the problem with "evidence based policy")

CERN Library Book presentation - 11 October, 2017 – TH Conference Room


1. The four challanges making problematic the adoption of the "evidence based policy" approach
2. Science on the verge: the chapters of the book
#euforiebcn

The co-existence of multiple scales at which we can and should observe the external world

A scale is a lens through which we observe the world

Challenge #1

how to identify “the right” scale
for “the right” purpose?

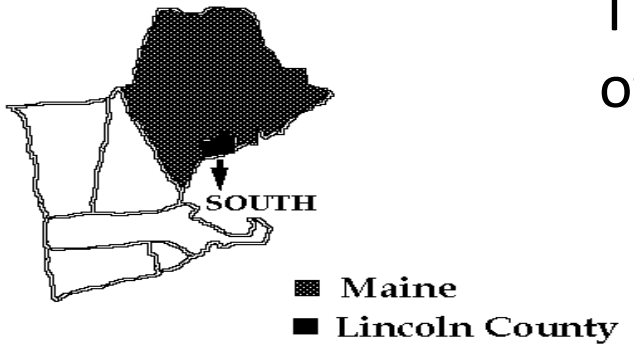
The issue of scale

WHY you have chosen HOW to see WHAT you see . . .

Right perce n when checking the local time before calling Los Angeles

Hierarchical Levels:

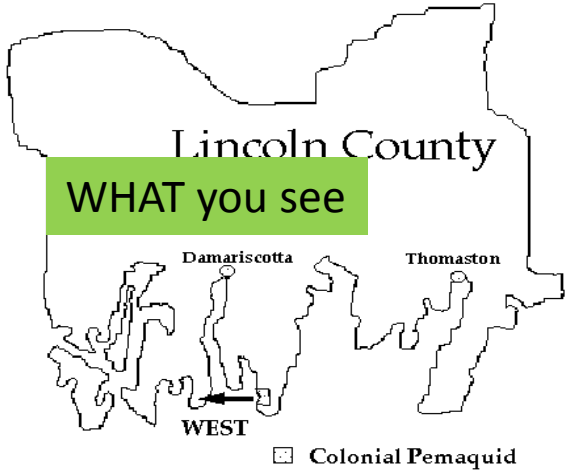
Federation (whole country)/State



Hierarchical Levels:

State/County

HOW to see



WHAT you see

HOW to see

Hierarchical Levels:

County/Village

WHAT you see

Right perception when looking for a house with a sunset view

WHY you have chosen HOW to see WHAT you see . . .

Hierarchical Levels:

Village/specific beach

If you want to solve this problem . . .

Right narrative when checking the local time before calling Los Angeles

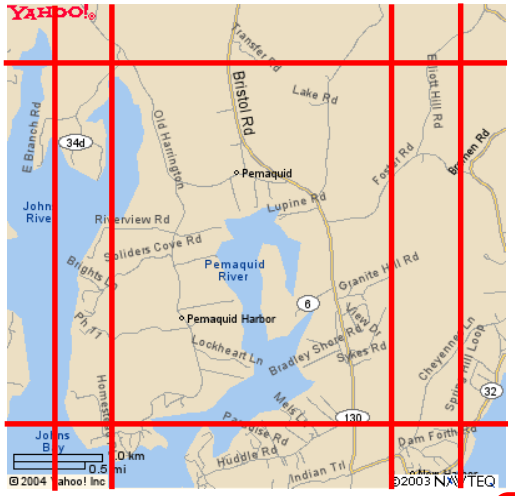
Hierarchical Levels:

Federation (whole country)/State

Perception/Representation of space = globe

You see a space which is the surface of a sphere

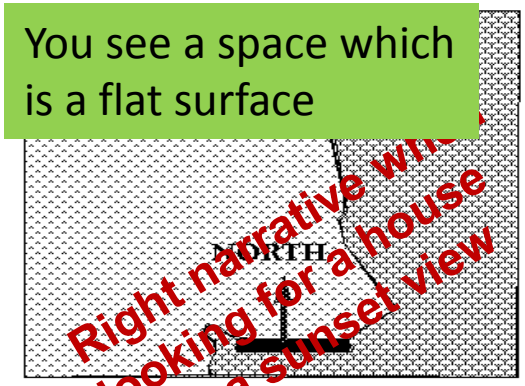
The validity of "evidence based policy" depends on the choice of story-telling



Perception/Representation of space = plane

If you want to solve this problema

You see a space which is a flat surface



Right narrative when looking for a house with a sunset view

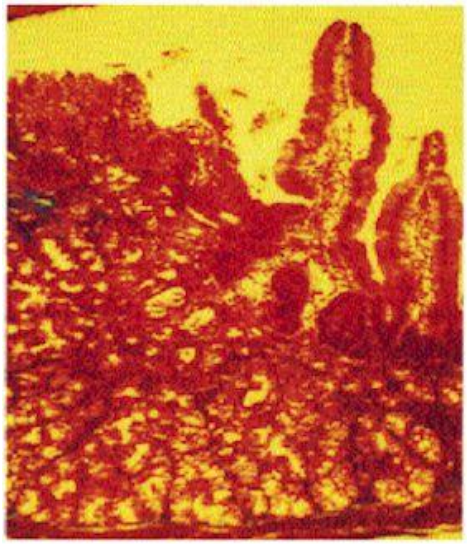
Colonial Pemaquid

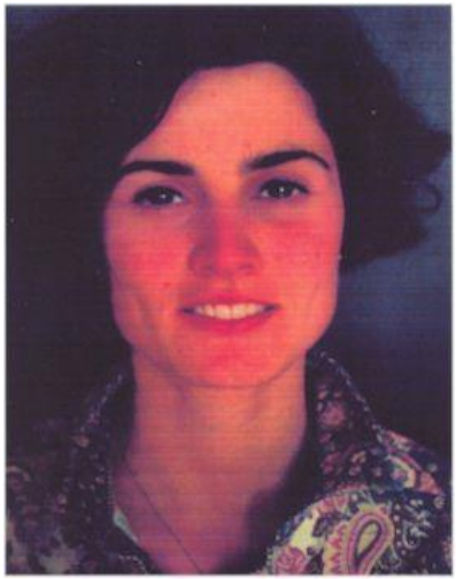
Polly's beach

Hierarchical Levels:

Village/specific beach

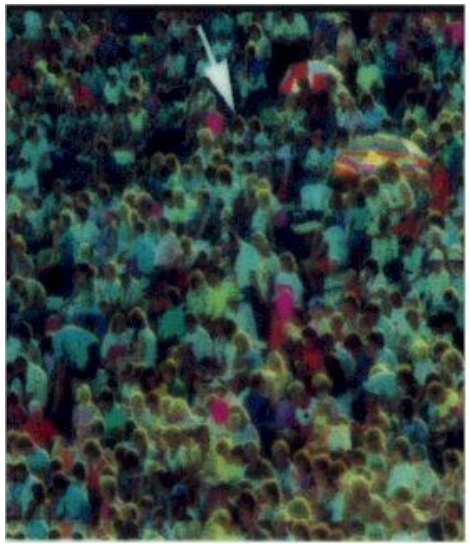
Non-equivalent narratives = Non-reducible models

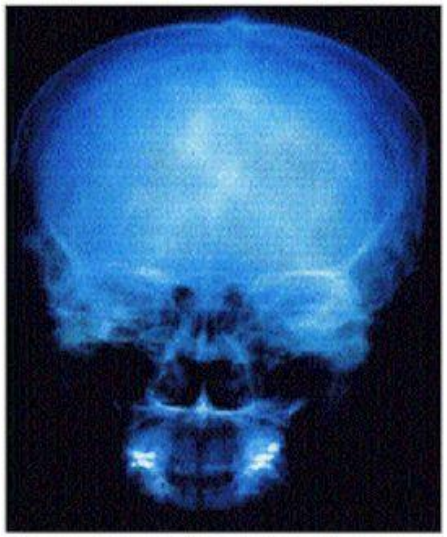




Different space-time domains

Different criteria of observation





Which one of these two cars will generate more harm to the atmosphere in terms of emissions?

Willliam Stanley Jevons
The coal question - 1865

The Jevons' Paradox

More efficient cars will imply more consumption of gasoline!

HUMMER: 45,000 US$
Fuel economy: 6 km/liter
"*evidence*" for efficiency?

Out of production since May 2010

SMART: 10,000 US$
Fuel economy: 14 km/liter
"*evidence*" for efficiency?

More than 1.6 million and counting

Narratives as explanations of causality

Challenge #2

how to identify “the right” narrative
for “the right” story teller?

International Conference on World Food Security - SAGUF -Zurich, October 9 - 10, 1996

EXPERTS' ADVICE

National Policy

Keep prices of food commodities **LOW**	Protecting the urban poor
Keep prices of food commodities **HIGH**	Protecting the poor farmers

International Policy

REDUCING imports from the South	Avoiding externalization of environmental impact to the South
INCREASING imports from the South	Developing the agricultural sector in the South

Social Policy

PRESERVING local cultural heritage	Protecting cultural diversity
FIGHTING local cultural heritage (!!??)	Protecting wives burned alive together with dead husbands

Event to be dealt with: THE DEATH OF A PARTICULAR INDIVIDUAL

NARRATIVE	Story-Teller
EXPLANATION 1 --> "no oxygen supply in the brain" *Space-time scale*: VERY SMALL *Example*: EMERGENCY ROOM *Implications for action*: APPLY KNOWN PROCEDURES *Based on known HOW - past affecting strongly present actions*	D ctor in the ency room
EXPLANATION 2 --> "affected by lung cancer" *Space-time scale*: SMALL *Example*: MEDICAL *Implications for action*: KNOWN PROCE ERIMENTATION *Looking for a better HOW - past af at room for change*	Pharmaceutical researcher
EXPLANATIO dual was a heavy smoker" *Space-tim Example*: MEETING AT HEALTH MINISTRY *Implicatio ion*: MIX EXPERIENCE AND WANTS INTO POLICY *Considering HOW and WHY - past and "virtual future" affecting present*	Tax expert
EXPLANATION 4 --> "humans must die" *Space-time scale*: VERY LARGE *Example*: SUSTAINABILITY ISSUES *Implications for action*: DEALING WITH THE TRAGEDY OF CHANGE *Considering WHY - "virtual future" (values) affecting present*	Philosopher

FOUR USEFUL STORY-TELLINGs

Event to be dealt with: THE DEATH OF A PARTICULAR INDIVIDUAL

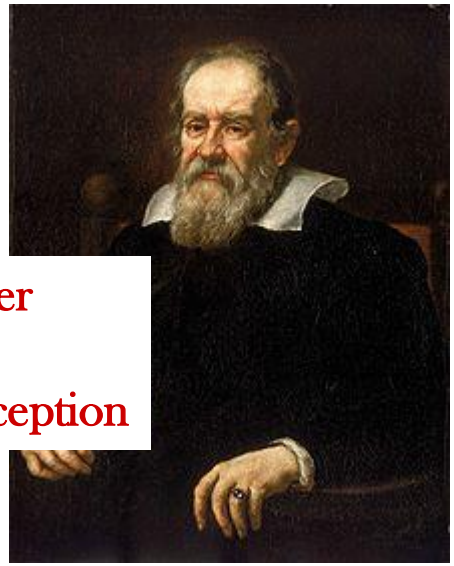
NARRATIVE	Story-Teller
EXPLANATION 1 --> "no oxygen supply in the brain" *Space-time scale*: VERY SMALL *Example*: EMERGENCY ROOM *Implications for action*: APPLY KNOWN PROCEDURES *Based on known HOW - past affecting strongly present actions*	expert
EXPLANATION 2 --> "affected by lung cancer" *Space-time scale*: SMALL *Example*: MEDICAL *Implications for action*: KNOWN PROCE ERIMENTATION *Looking for a better HOW - past af at room for change*	Philosopher
EXPLANATIO dual was a heavy smoker" *Space-ti Example*: MEETING AT HEALTH MINISTRY *Implicati ion*: MIX EXPERIENCE AND WANTS INTO POLICY *Considerin HOW and WHY - past and "virtual future" affecting present*	Doctor in the emergency room
EXPLANATION 4 --> "humans must die" *Space-time scale*: VERY LARGE *Example*: SUSTAINABILITY ISSUES *Implications for action*: DEALING WITH THE TRAGEDY OF CHANGE *Considering WHY - "virtual future" (values) affecting present*	Pharmaceutical researcher

FOUR USELESS STORY-TELLINGs

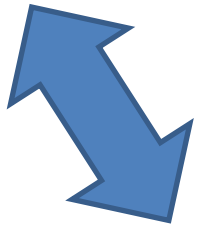
In order to be able to perceive and represent a part of "the reality" we have to deal with the pre-analytical definition of two dualities:

relevant perception?

"the self" ←→ "the other"



the story-teller deciding the relevant perception



the observation process determining a given representation

Is it a pertinent representation for the chosen narrative?

"the observed" ←→ "the context"

the descriptive domain

International Conference on World Food Security - SAGUF -Zurich, October 9 - 10, 1996

EXPERTS' ADVICE

* Different Story-tellers!

Story-telling about National Policy

I.F.P.R.I. - U.S. scientist *

Keep prices of food commodities LOW — Protecting the urban poor

Keep prices of food commodities HIGH — Protecting the poor farmers

Ag. Econ. - Prof. from Pakistan*

Story-telling about International Policy

Wuppertal Inst. - German scientist*

REDUCING imports from the South — Avoiding externalization

INCREASING imports from the South — Developing the agricultural sector

Ag. Dev. - Prof. from Ghana*

Story-telling about Social Policy

NGO - Swiss Feminist*

PRESERVING local cultural heritage — Protecting cultural diversity

FIGHTING local cultural heritage — Protecting wives burned alive together with dead husbands

Sociologist - Prof. from India*

What degree of anticipation can you get from narratives?

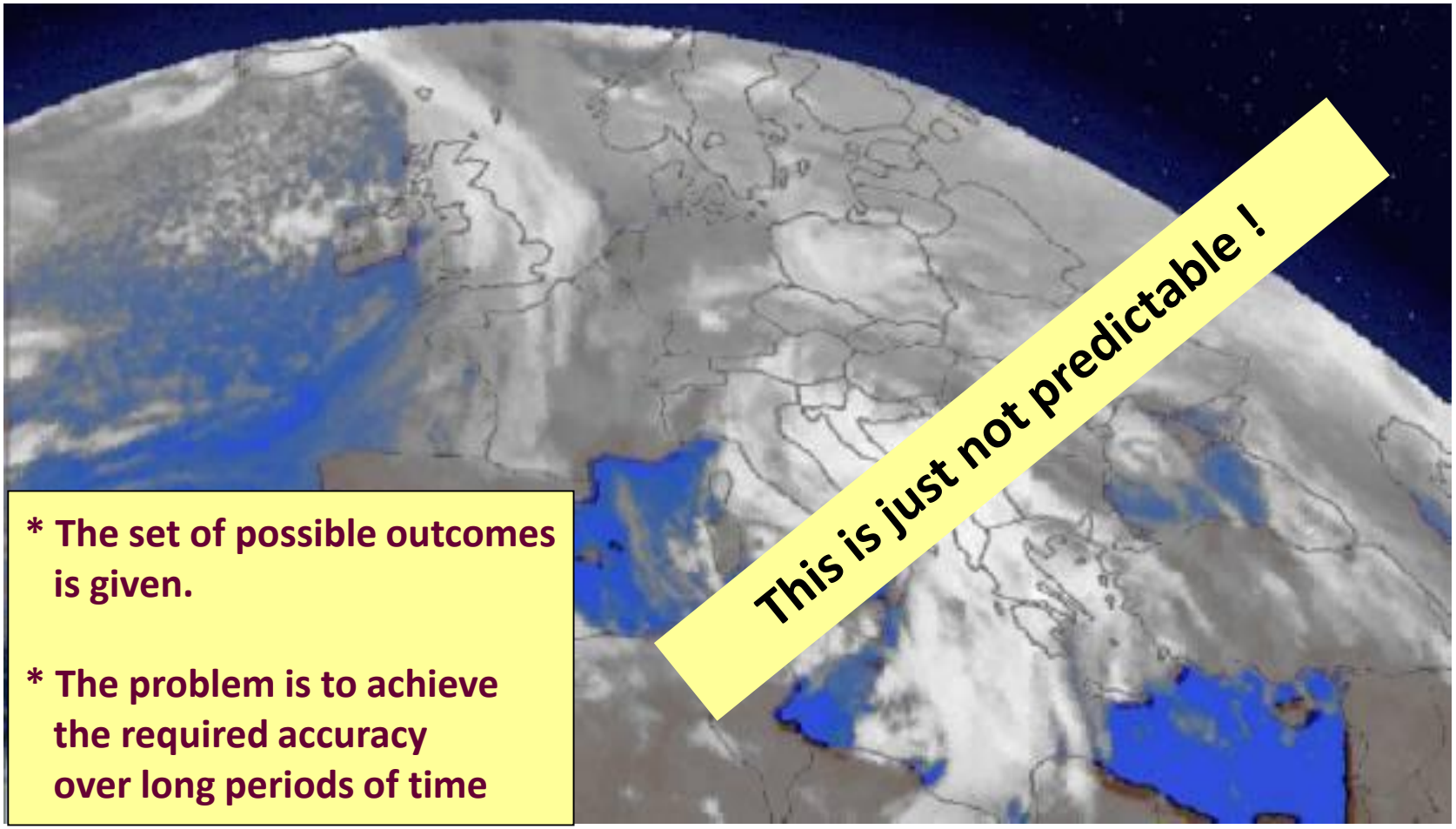
Challenge #3

The crucial difference between RISK and UNCERTAINTY

Purple Down desert, Australia

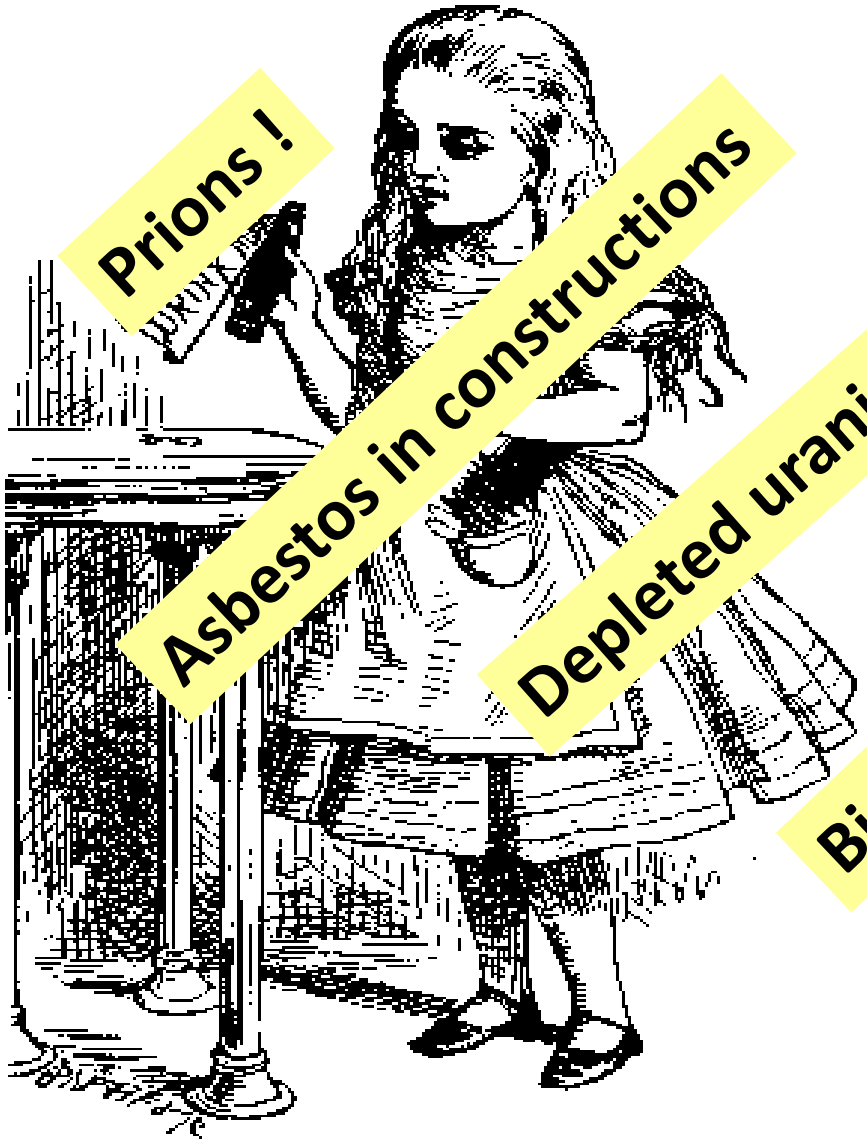
Reductionism can predict very well eclipses . . .

Conventional risk assessment is based on the ability to define probabilities for an expected set of outcomes



The trouble with chaotic systems: "the butterfly effect"

Nobody can predict the weather in London in 60 days . . .



IGNORANCE

It is not about being unable of estimating probabilities

It is about not knowing the slightest ... about possible outcomes

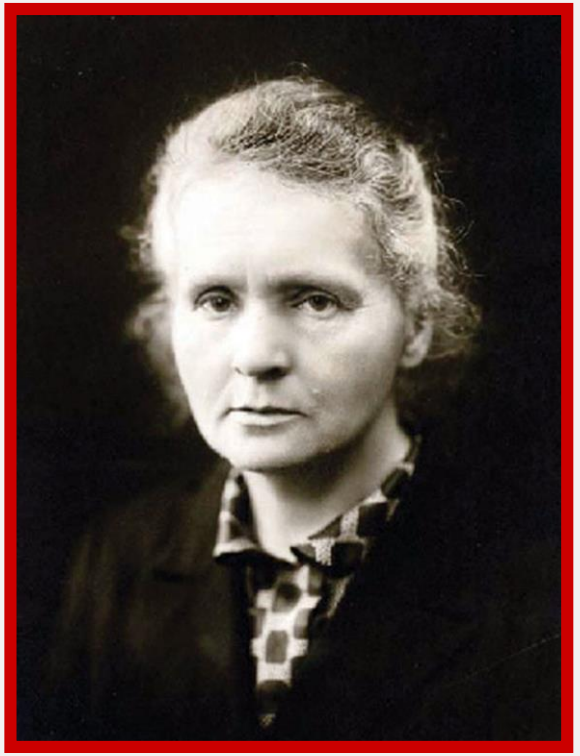
IGNORANCE is not knowing a set of attributes of the system which will result relevant for us in the future

Alice wondering about the "DRINK-ME" bottle

TO DEAL WITH IGNORANCE IT IS NOT WISE TO RELY ONLY ON THE OPINION OF THE "EXPERTS"

Marie Curie born in 1867

The best expert on "radioactivity"
(she invented the term!)



Nobel Prize in Physics 1903

Nobel Prize in Chemistry 1911

She died in 1934 almost blind from exposure to radiation
(her daughter and others in the lab suffered the same fate . . .)
She never realized the damaging effect of ionizing radiations

How to deal with social incommensurability?

Challenge #4

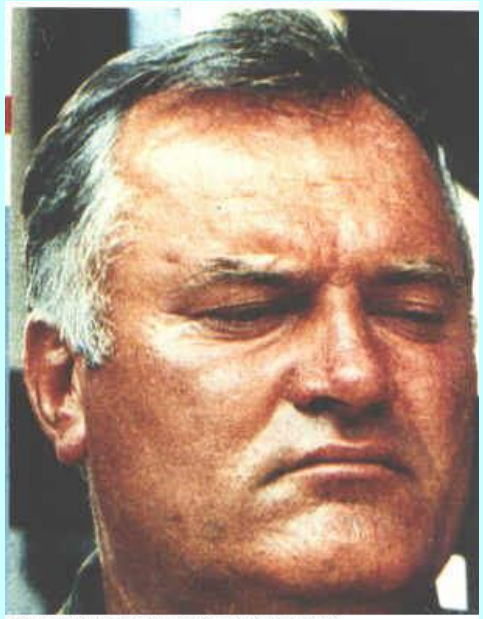
It is unavoidable to find contrasting but legitimate perceptions about the same reality . . .

Wanted by Interpol

www.interpol.int/public/Wanted/notices/Data/1995/54/1995_47754.asp

1995

MLADIC, Ratko



1995/47754 MLADIC RATKO

Present family name: **MLADIC**
Forename: **RATKO**
Sex: MALE
Date of birth: 12 March 1943 (59 years old)
Place of birth: BOZINOVICI, Bosnia and Herzegovina
Language spoken: SERBO CROAT
Nationality: FORMER YUGOSLAVIA

Physical description

Height: 1.70 meter <-> 67 inches
Colour of eyes: BLUE
Distinguishing marks and characteristics: STOCKY BUILD, HIGHLY COLOURED COMPLEXION

Person may be dangerous.

Offences: ASSAULT , CRIMES AGAINST HUMANITY , CRIMES AGAINST LIFE AND HEALTH , GRAVE BREACHES OF THE 1949 GENEVA CONVENTIONS , MURDER , PLUNDER , VIOLATIONS OF THE LAWS OR CUSTOMS OF WAR

Arrest Warrant Issued by: / INTL COURT THE HAGUE

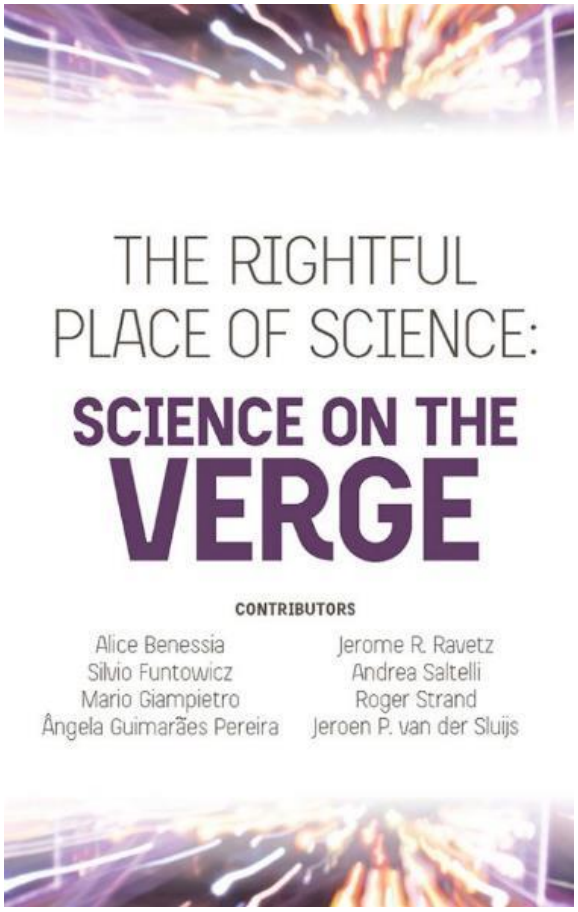
Ratko MLADIC: a dangerous criminal on the Interpol website

Ratko MLADIC: a hero in a Serbian bakery

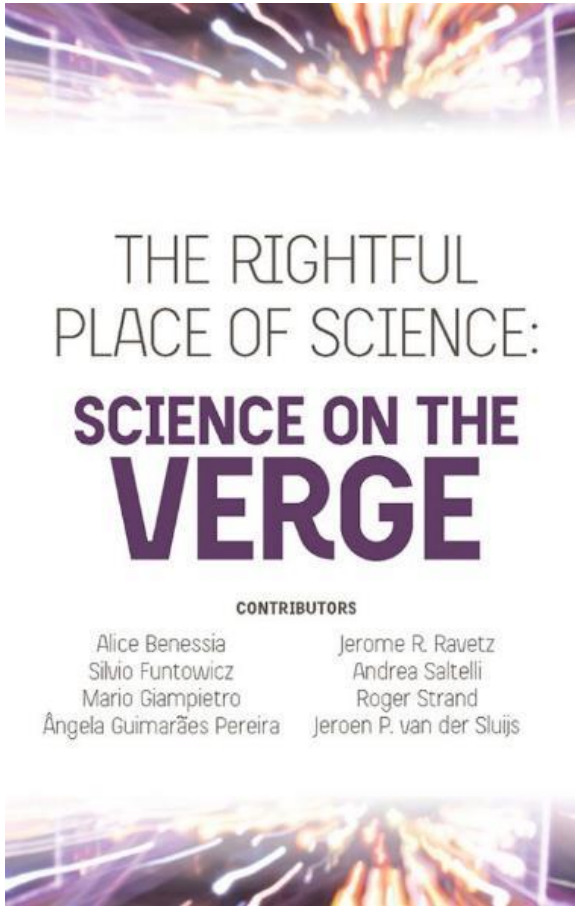
The vision of transnational firms producing GMOs

The vision of residents of a small village near Rome

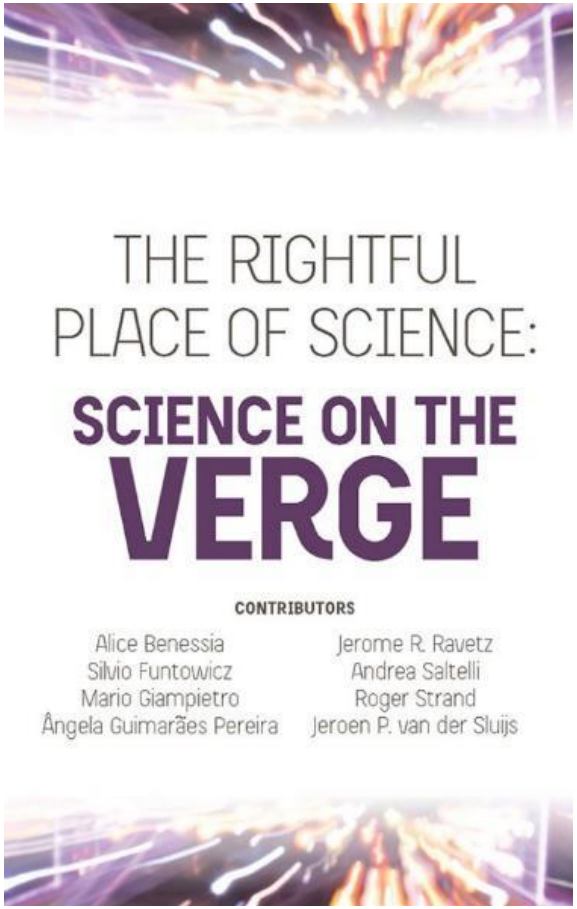
The book's chapters



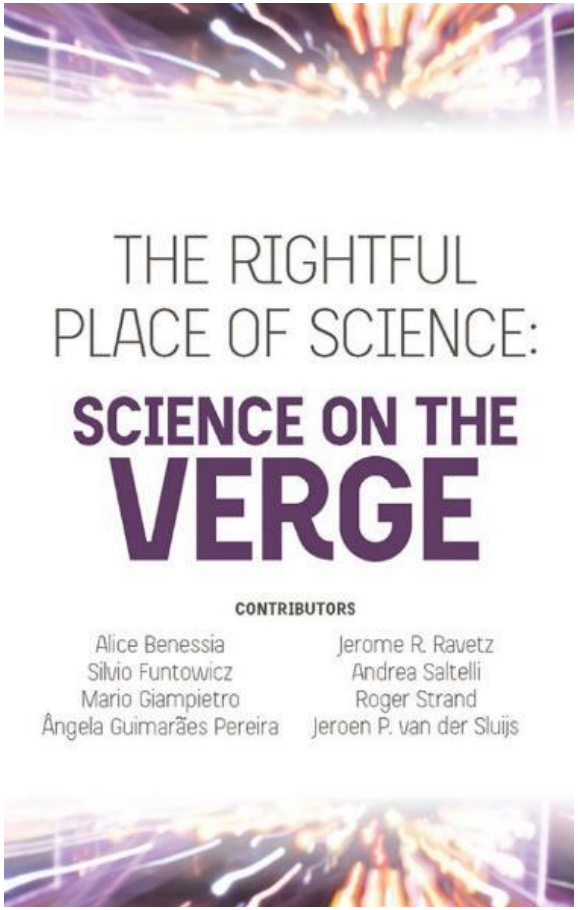
Dan Sarewitz, **Preface**; Pedro Almodóvar, Jonathan Swift, the floating island of Laputa and a portrayal of XVIII science; what lesson for science's present predicaments.



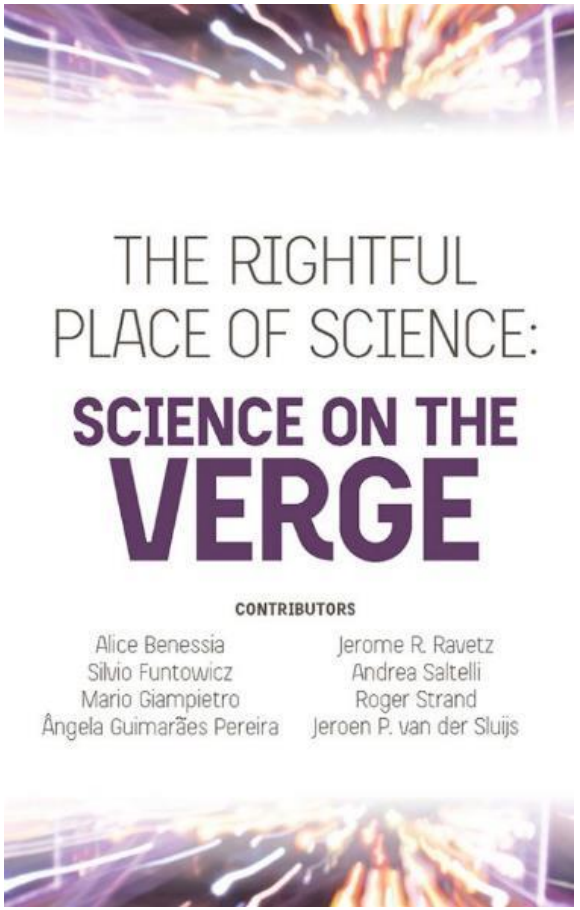
Chapter 1. Andrea Saltelli, Jerome Ravetz, Silvio Funtowicz: **Who will solve the crisis in science?** Is there a crisis? What is being done 'from within'? Is this sufficient? What are the diagnoses for the crisis' root causes, and what are the solutions 'from without'?



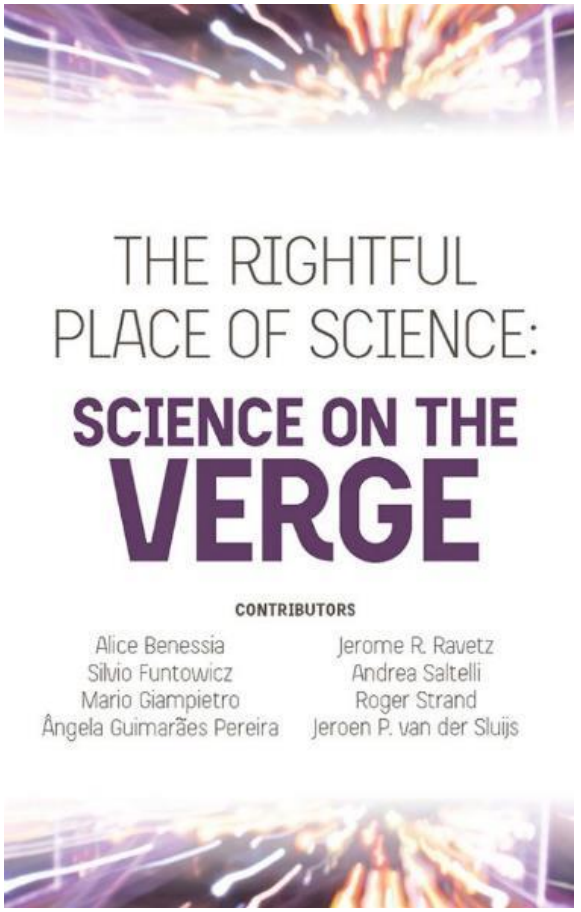
Chapter 2. Andrea Saltelli, Mario Giampietro: **The fallacy of evidence based policy**: Quantification as hypocognition; socially constructed ignorance & uncomfortable knowledge; ancien régime syndrome; quantitative story telling.



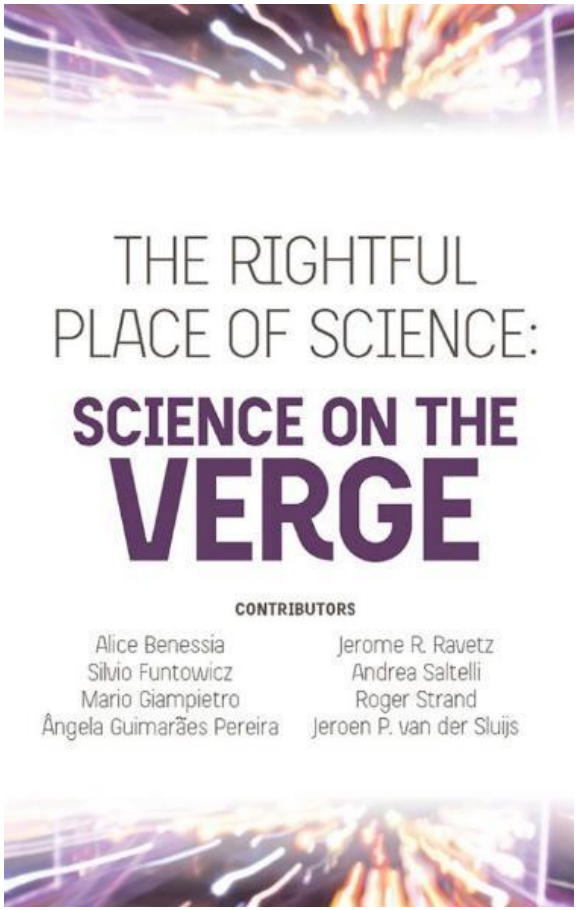
Chapter 3. Alice Benessia, Silvio Funtowicz: **Never late, never lost, never unprepared**; Trajectories of innovation and modes of demarcation of science from society: 'separation', 'hybridization' and 'substitution'; what contradictions these trajectories generate.



Chapter 4. Ângela Guimarães Pereira, Andrea Saltelli: **Institutions on the verge**; working at the science policy interface; The special case of the European Commission's in house science service; the Joint Research Centre as a boundary institutions; diagnosis, challenges and perspectives.



Chapter 5. Jeroen van der Sluijs: **Numbers running wild**; Uses and abuses of quantification and the loss of 'craft skills' with numbers; 7.9% of all species shall become extinct.



Chapter 6. Roger Strand: **Doubt has been eliminated**; Gro Harlem Brundtland's famous 2007 speech, after the Fourth IPCC report and the Stern review; when science becomes a 'life philosophy'; science as the metaphysics of modernity; the Norwegian Research Ethics Committee for Science and Technology inquiry.

While trust in science as such appears to be still substantially unscathed, the use of science to adjudicate policy disputes is increasingly conflicted;

This entails a crisis in the dual legitimacy system at the heart of modernity: that of science providing the facts and policy taking care of the values.