



LEARNING

*Group 3: Emma Berg,
Suvi Kinnarinen, Jukka-
Pekka Männikkö*



LEARNING CATEGORIES

introduction
exercise 1
summary

POST-NORMAL SCIENCE

introduction
criticism
exercise 2
summary

*How does our understanding
of systems progress
(or not progress) over time?*

LEARNING CATEGORIES



Gregory Bateson

1904-1980

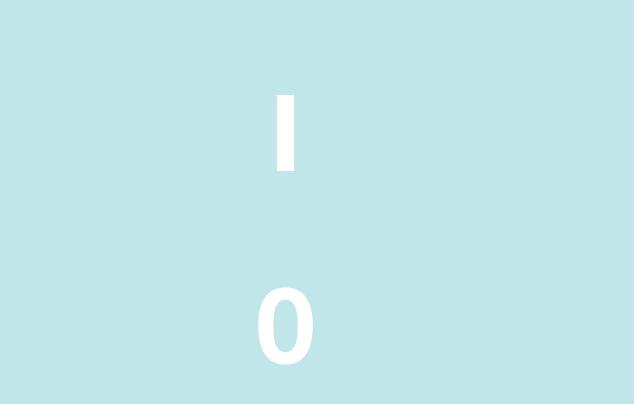
*Social Scientist
Anthropologist
Linguist
Cyberneticist
Philosopher*







*Are we doing
things right?*



IV
III
II
I
0

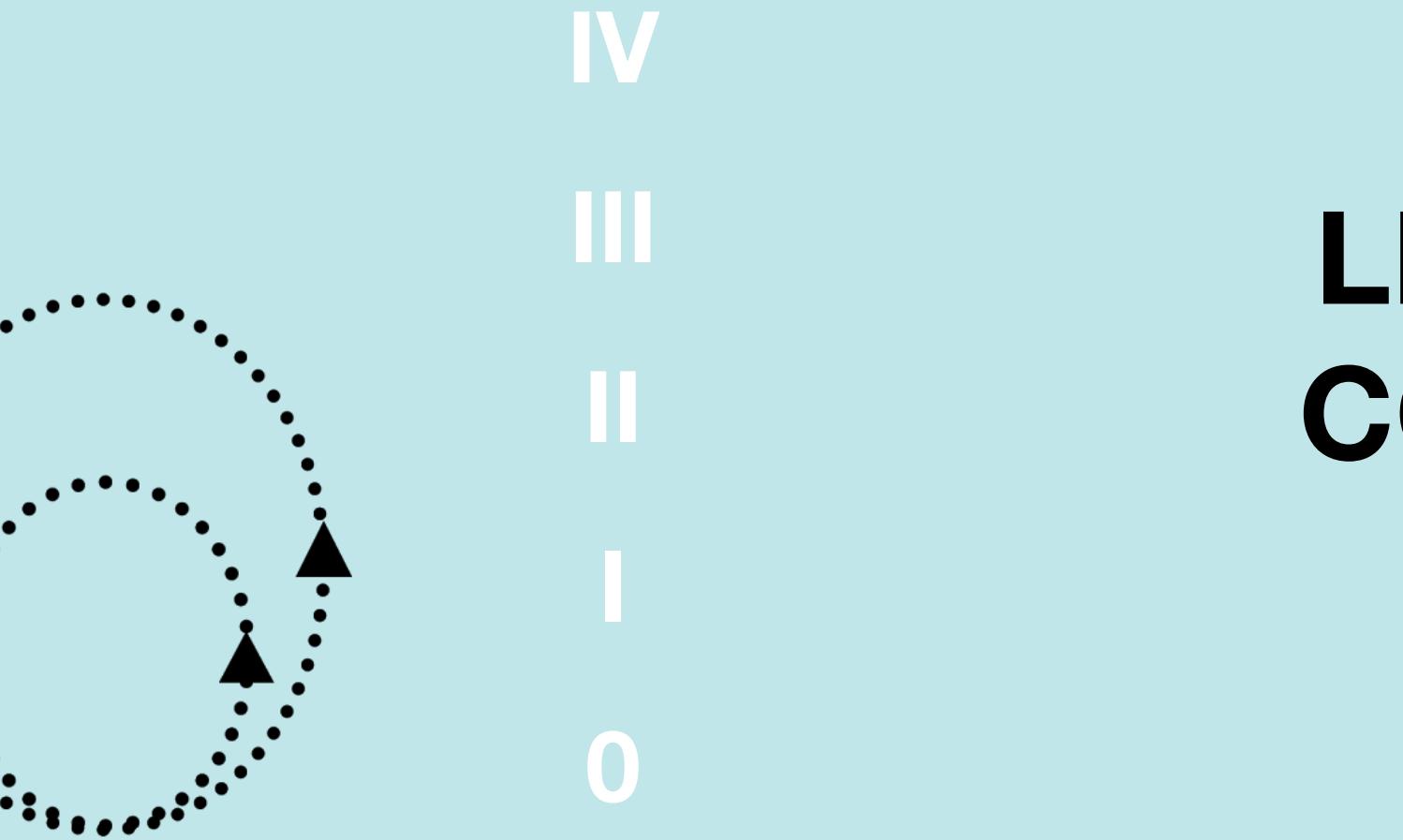
LEARNING I: LINEARITY

Single loop learning

Learning through reinforcement



*Are we doing
the right thing?*

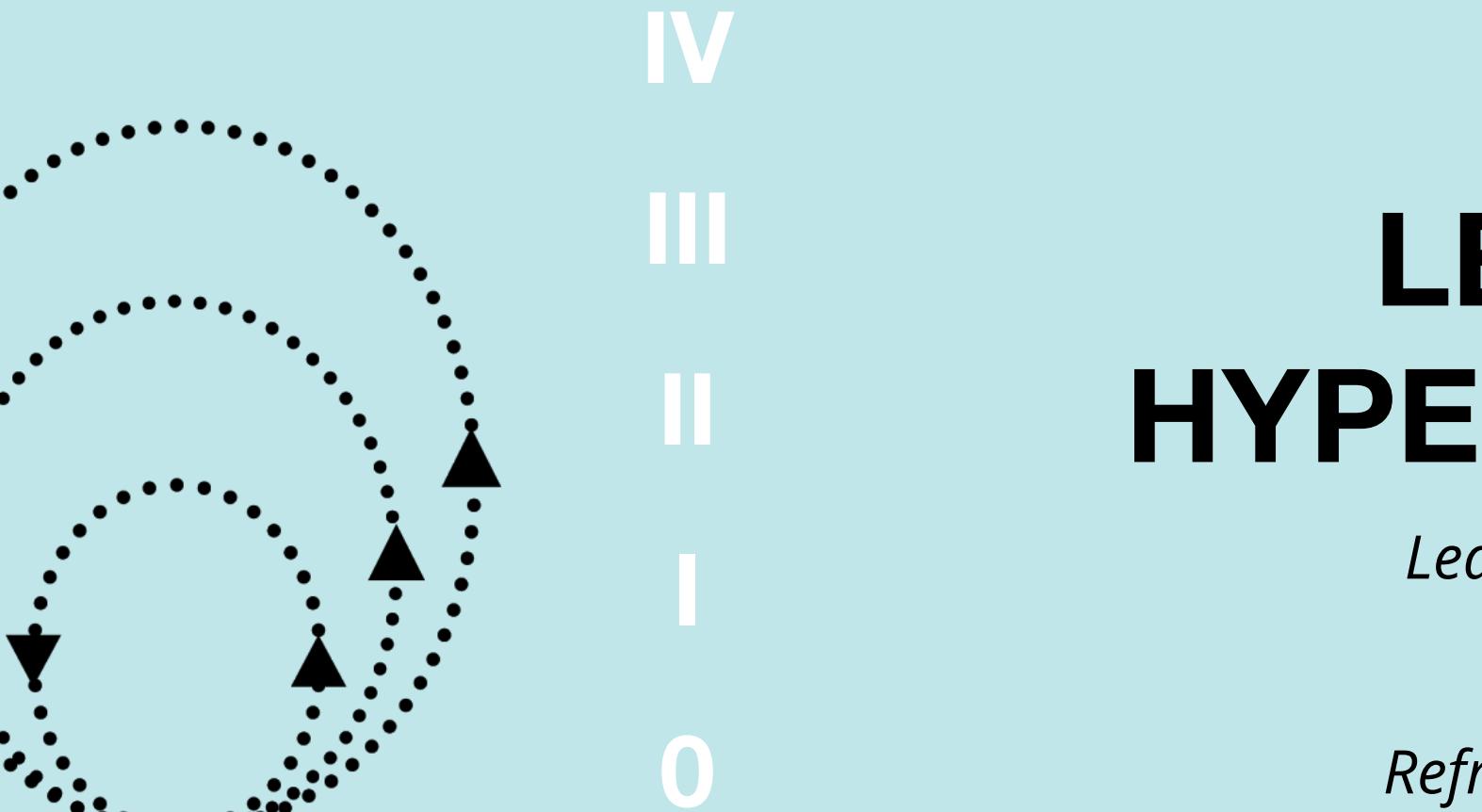


LEARNING II: COMPLEXITY

*Double loop learning
Learning to learn
Deutero-learning*



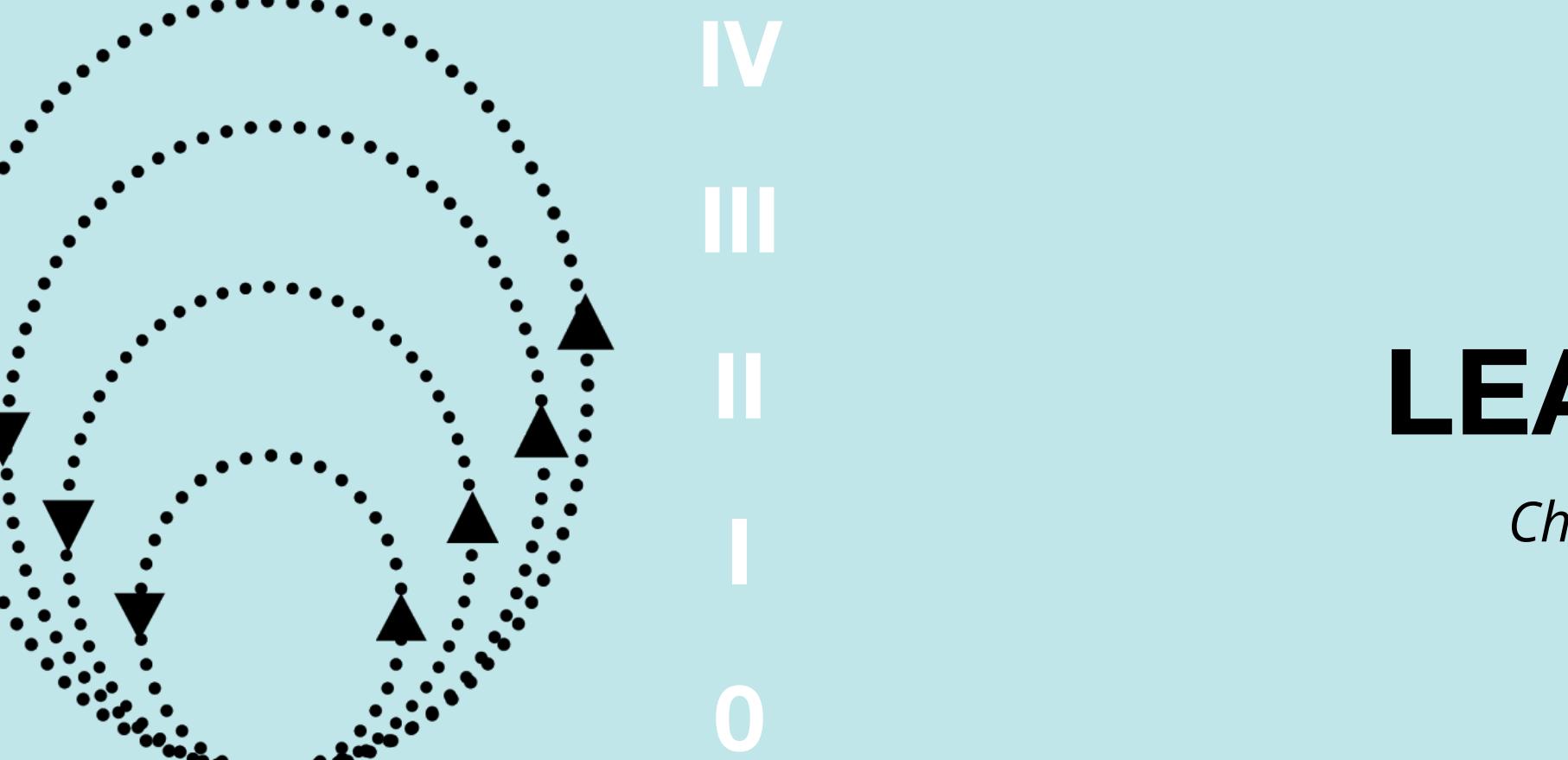
*How do we decide
what is right?*



LEARNING III: HYPER-COMPLEXITY

*Learning how to learn to learn
Triple loop learning
Reframing the world / character*

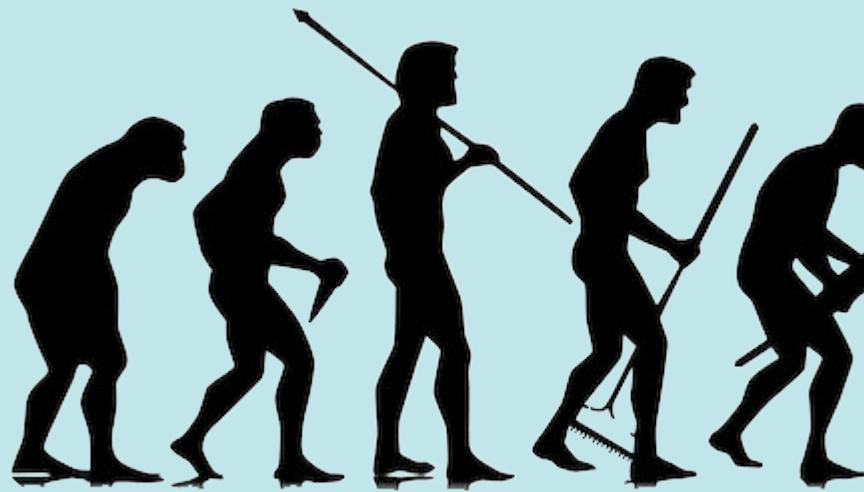




IV
III
II
I
0

LEARNING IV

*Change in learning III
Paradigm shift
Evolution?*





EXERCISE: ANTHROPOLOGIST

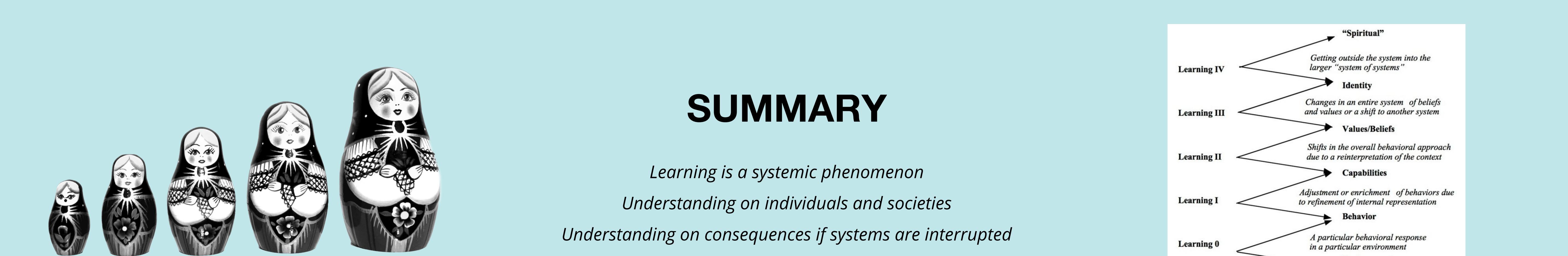


*WOMEN ANSWER ONLY TO **WOMEN**
IF THE PERSON ASKING IS SERIOUS, **SAY NO**
IF THE PERSON ASKING SMILES, **SAY YES***

EXERCISE: ANTHROPOLOGIST



EXERCISE: ANTHROPOLOGIST



“Spiritual”

Getting outside the system into the larger “system of systems”

Learning IV

“Spiritual”

Getting outside the system into the larger “system of systems”

Identity

Learning III

Changes in an entire system of beliefs and values or a shift to another system

Values/Beliefs

Learning II

Shifts in the overall behavioral approach due to a reinterpretation of the context

Capabilities

Learning I

Adjustment or enrichment of behaviors due to refinement of internal representation

Behavior

Learning 0

A particular behavioral response in a particular environment

Environment

Bateson’s
Logical Levels
of Learning

Dilts’
NeuroLogical Levels

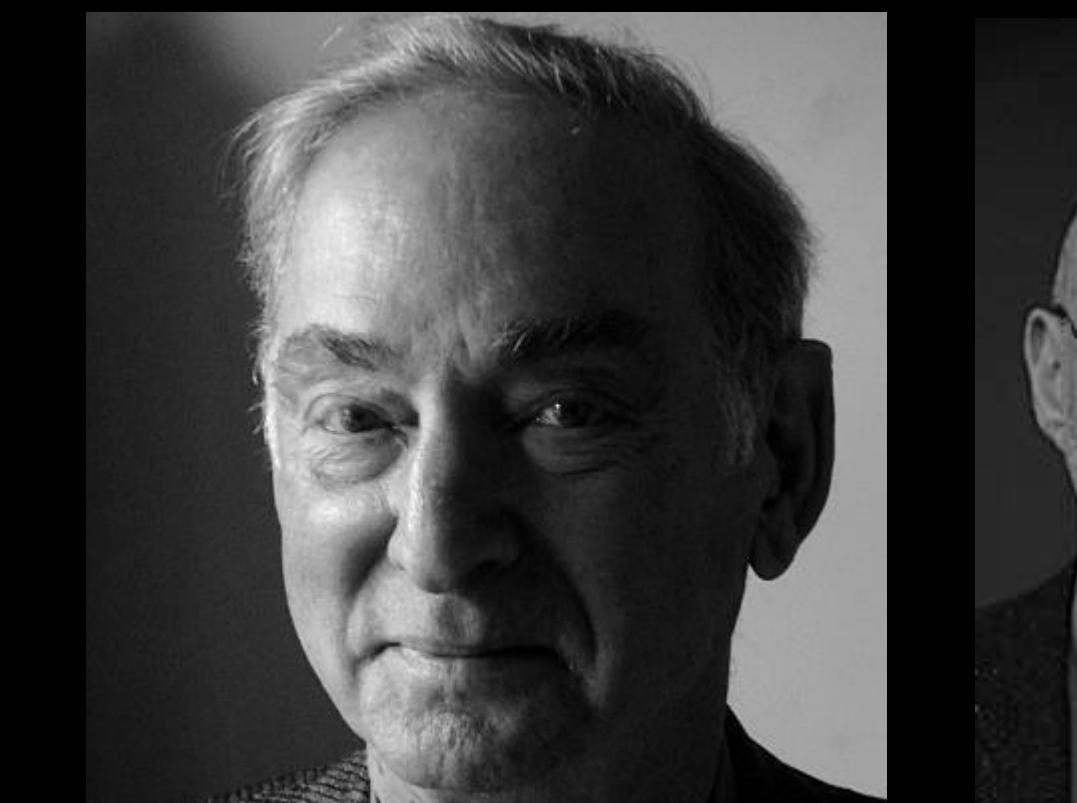
SUMMARY

Learning is a systemic phenomenon

Understanding on individuals and societies

Understanding on consequences if systems are interrupted

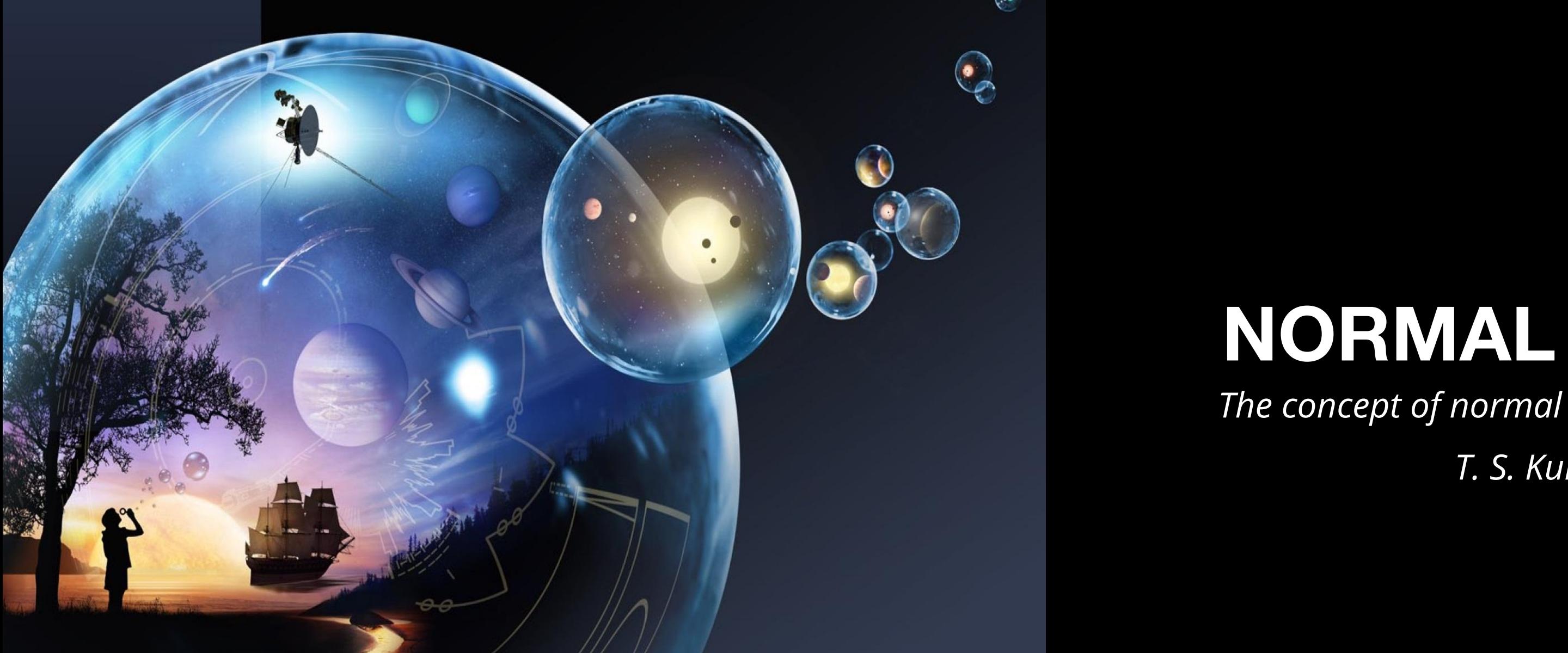
POST-NORMAL SCIENCE



POST-NORMAL SCIENCE



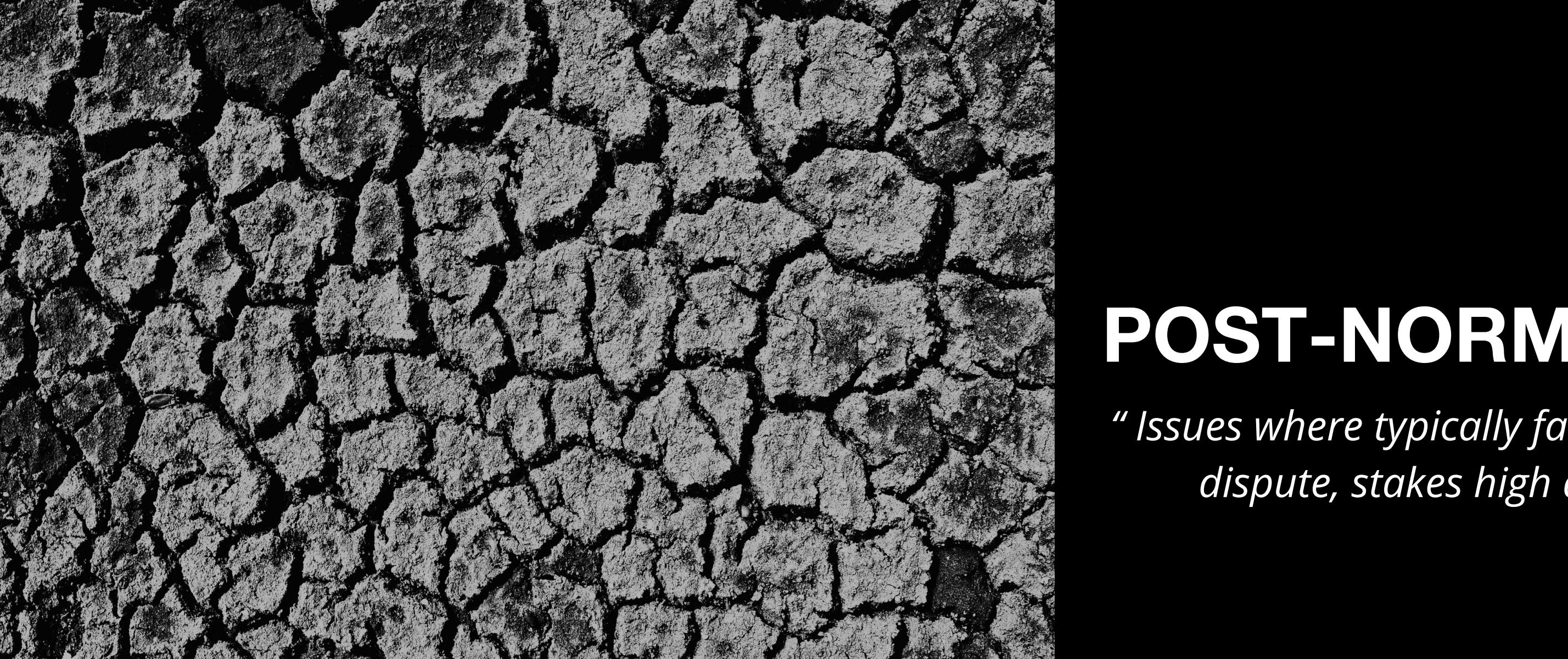
"Three Mile Island Nuclear Generating Station" by Z22 - Own work. Licensed under CC BY-SA 3.0 via Commons -



NORMAL SCIENCE

The concept of normal science by philosopher

T. S. Kuhn 1962

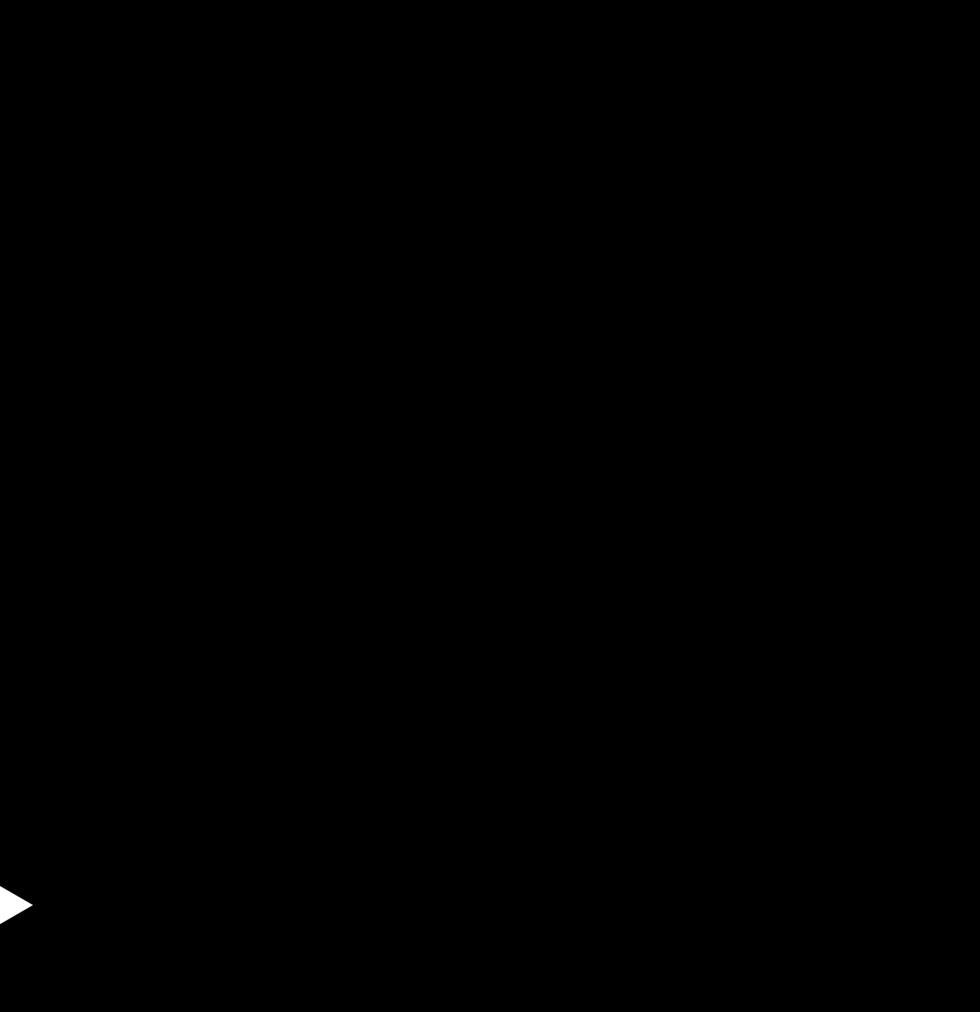


POST-NORMAL SCIENCE

“Issues where typically facts are uncertain, values in dispute, stakes high and decisions urgent”



"Absence of evidence of harm is not evidence of absence of harm"





PRECAUTION



EXTENDED PEER COMMUNITY



QUALITY ASSURANCE



DISCUSSION

CRITICISM

What has been said about this concept and why?

By David Waltner-Toews, James J. Kay, Nina-Marie E. Lister

"Lack of objectivity and refusal to assert just one answer is precisely why systems thinking is not normal science but rather post-normal science. In the domain where systems thinking applies, normal science also cannot come up with objectivity, but what if the important issues lie in the middle of the arena? Systems thinking has the courage to continue to pursue happy outcomes anyway, and it simply accepts that the only tools left deny unequivocal objectivity" - The Ecosystem approach

What in your opinion could be the signs of post-normality in our times?

How could we approach the presumed post-normality of our times with a positive attitude?

Can you think of any topics in the public discussion on science that might have something to do with post-normality?

What is the current government's attitude towards science and research in your opinion?

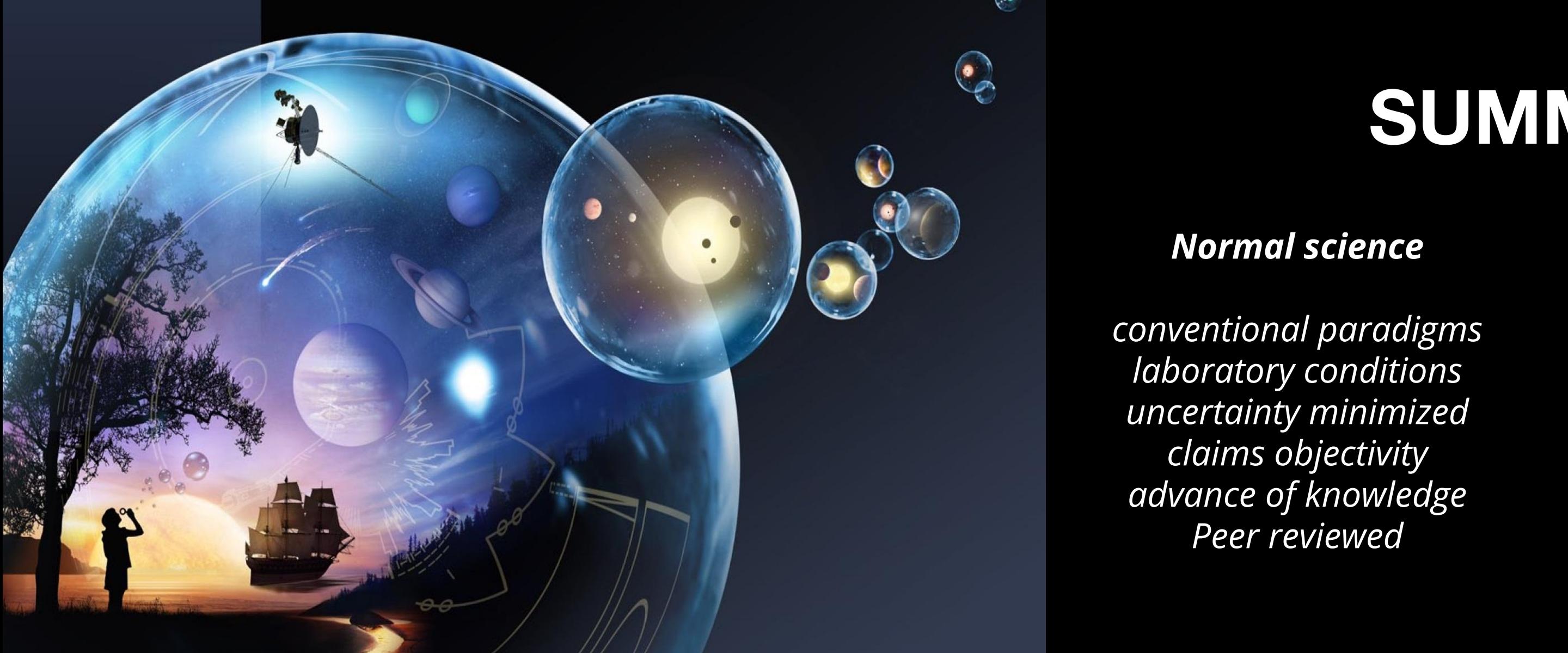
EXERCISE 2

Has science taken the place of religion and birthright as a rationale for governance?

If it has, Is it justified? What might be the issues related?

Do you think that there is a need to teach values/ethics to scientists, engineers for example?

Where might values be embedded in science / in research? Do you employ values in your studies?



SUMMARY

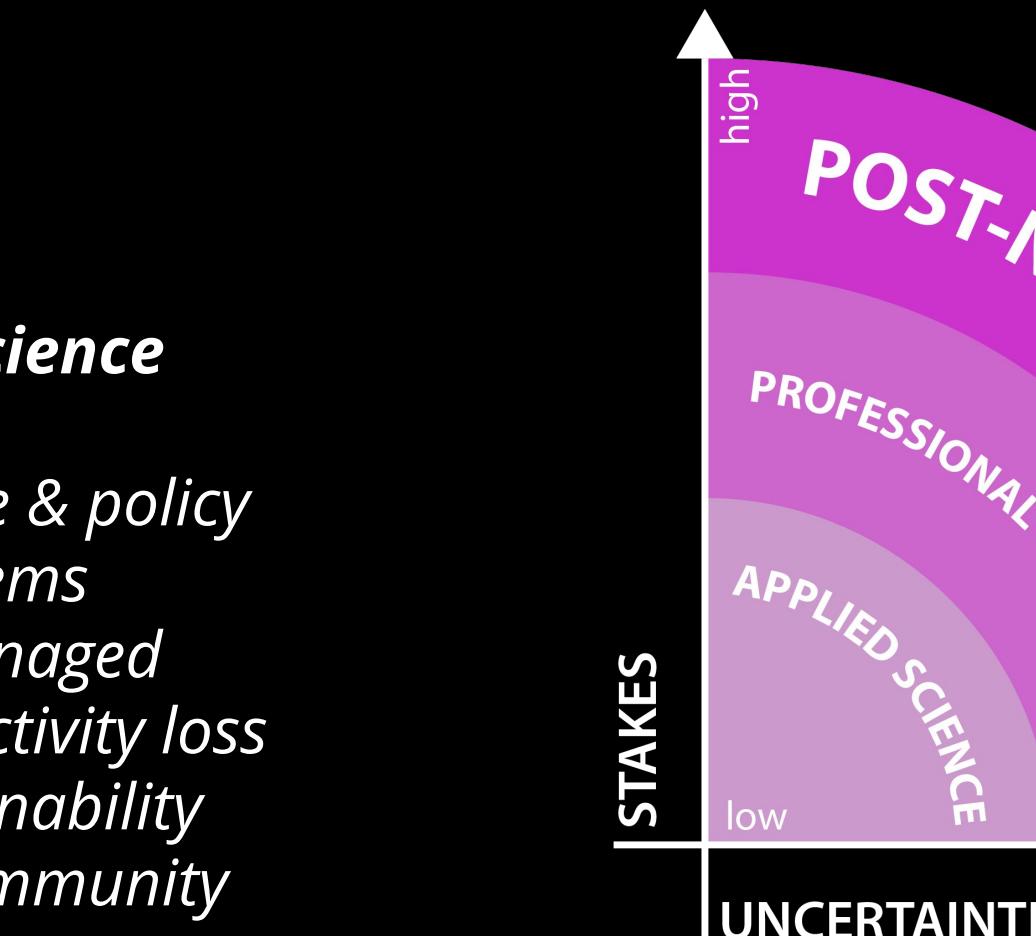
Normal science

*conventional paradigms
laboratory conditions
uncertainty minimized
claims objectivity
advance of knowledge
Peer reviewed*

Post-normal science

*interface of science & policy
messy problems
uncertainty managed
acknowledges objectivity loss
safety and sustainability
Extended peer community*

"Issues where typically facts are uncertain, values in dispute, stakes high and decisions urgent"



IGNORANCE

1. I have no idea!
2. If I knew the answer, I wouldn't be so dumb!
3. Not knowin' nuttin'
4. Thinking you know everything
5. Refusing to learn from experience, from failure, from mistakes, from others, from anything.
6. Arrogance and stubbornness
7. Intellectual bigotry

- Dennis Rohatyn, PhD
University of San Diego
Professor of Philosophy

WHAT IS IGNORANCE?

"Ignorance is the kind of not knowing that comes from insight and leads to insight. That insight -- the one it comes from and the one it leads to -- is the discovery that there is a world far larger than the one that is known, one that (whether we know it or not) shapes all our knowns. It is a world we know nothing about, though if we search we can catch glimpses of it. Ignorance is the not knowing that opens us up to philosophical wonder, to scientific discovery, to human wisdom."

- Gerald Nosich, PhD
University of New Orleans
Professor of Philosophy

*ANTICIPATING ORGANIZATIONAL COMPETENCES FOR DEVELOPMENT
THROUGH THE DISCLOSING OF IGNORANCE*

David Ing, Minna Takala and Ian Simmonds, 2003

WHAT CAN WE GAIN FROM IGNORANCE?

Organizational capability is an available resource that has the potential for producing an outcome

CAPABILITY VS COMPETENCE

Organizational perspective (social systems)

Organizational competence is an expertise shared by members of work group to apply skills, tools and infrastructure towards effective performance in response to a prospective or prior situation

Organizations pursuing development of their competences must balance the pursuit of mastery in the present against the potential of innovations that may enable success in the future.

Way of Knowing	Mitroff & Linstone (1993)	Mitroff (1998)	Churchman (1971)
First	Inductive – Consensual	Expert Consensus	Locke: consensus
Second	Analytic – Deductive	Expert Modeling	Leibniz: fact nets
Third	Multiple Realities	Multiple Models	Kant: representations
Fourth	Conflict	Conflict	Hegel: dialectic
Fifth	Unbounded Systems Thinking	Systemic Reasoning	Singer: progress

INQUIRING SYSTEMS

*Social reproduction of practices can overwhelm inquiry
Inquiring systems on their own do not follow through with an understanding of action, or of social practice. Even when community members know that they should change direction, they often don't behave that rationally. They know the right thing to do, but don't do it.*

CHANGING DIRECTION

*Redirecting organizational competences may require
recognition and disclosing of “new worlds”*

BREAKTHROUGH IN PRACTICES BY UNCOVERING IGNORANCE

*Multiple types of ignorance may be discovered in
individual or social system level*

Known unknowns
Passive ignorance

Unknown knowns
Active ignorance

What is the size of a market?

What will be the demand for a product next year?

What is the next winning tech platform?

KNOWN **UNKNOWN**S

Known unknowns can be cleared with continuous competence development

Gaps where competence development is clearly motivated - easiest type of ignorance to deal with

*Project failures may represent a large body of errors.
Shoot the messenger or try to learn from the failures..*

*Unexploited proprietary knowledge, forgotten
technologies*

PASSIVE IGNORANCE

*Ignoring can be overcome through self-reflection,
criticism, review and cross-functional competence
Errors and “unknown knowns” in competences
sharing*

*Restricting exchange of information to only others in the
same organization may be a mistake*

Blind spots in knowledge, chaos and complexity.

*When an unknown can't be categorized it causes
discomfort for our understanding of the world*

UNKNOWN UNKNOWNS

Testing the ability of competences to handle surprises



Taboos and denials are actively defended through organizational norms and protocols that reinforce their strength

Attacking “the ignored” may be perceived as an attack on the group itself

ACTIVE IGNORANCE

Overcoming the ignored requires listening to alternative voices with credibility

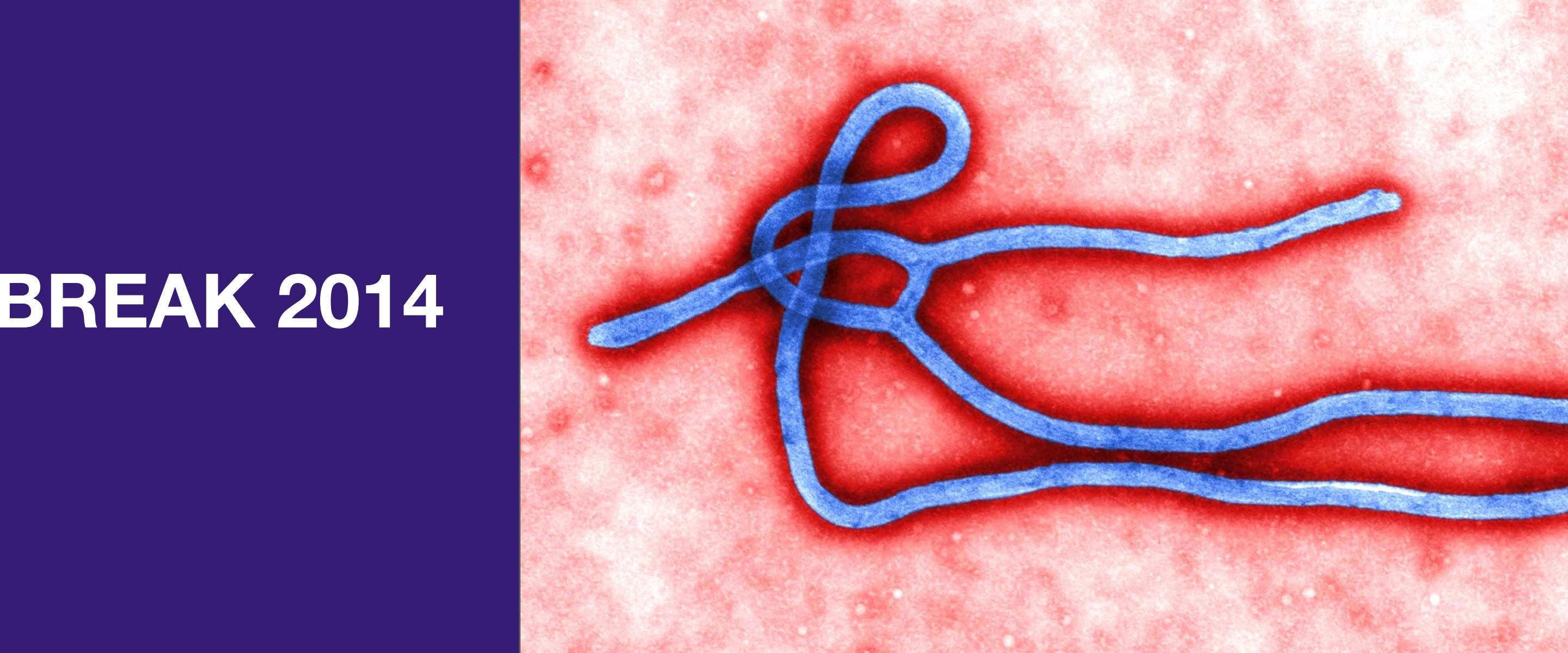
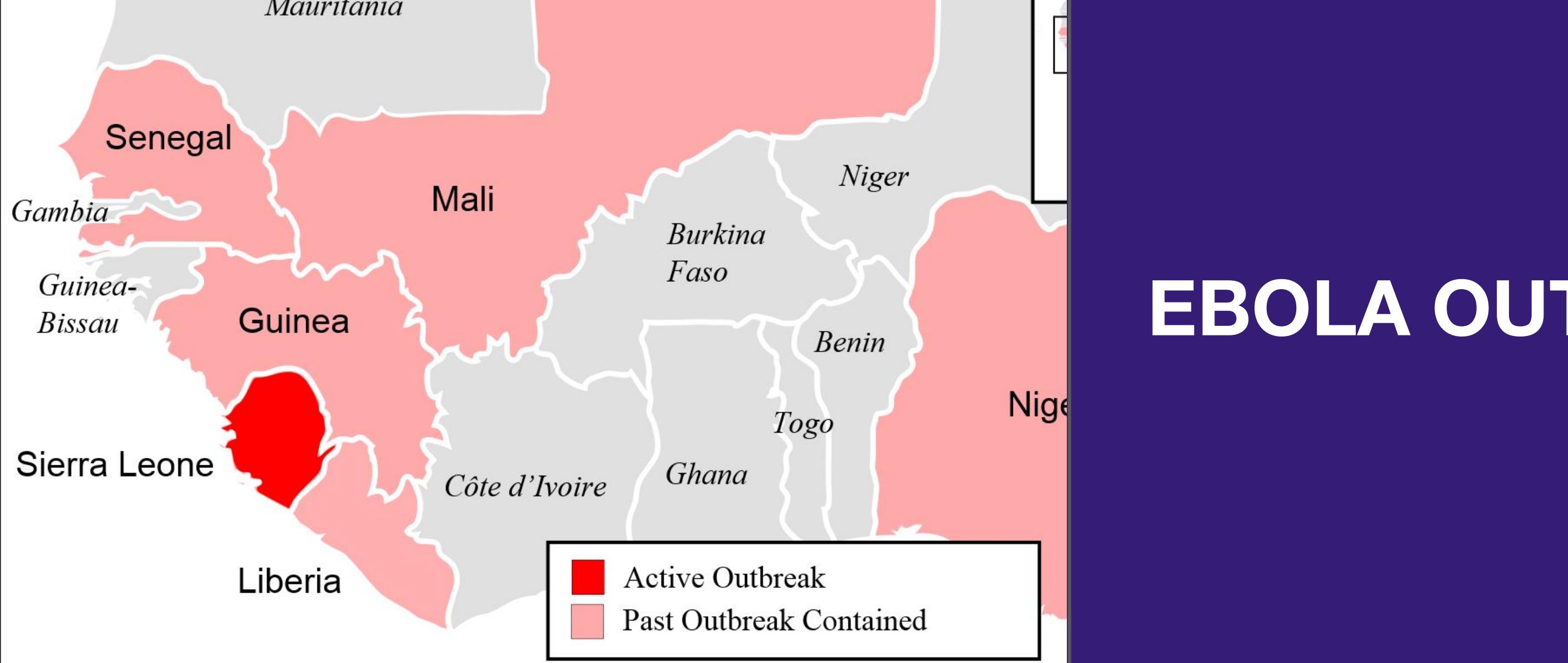
The ignored

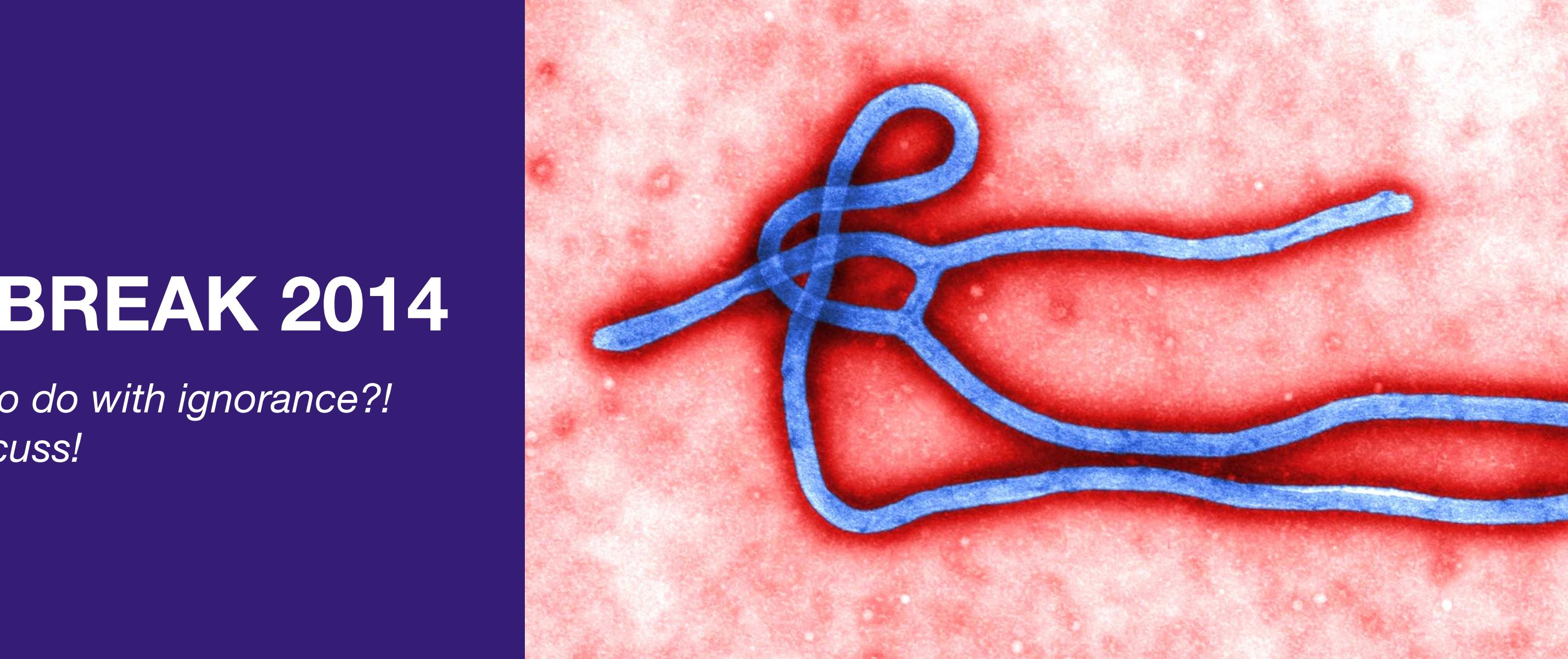
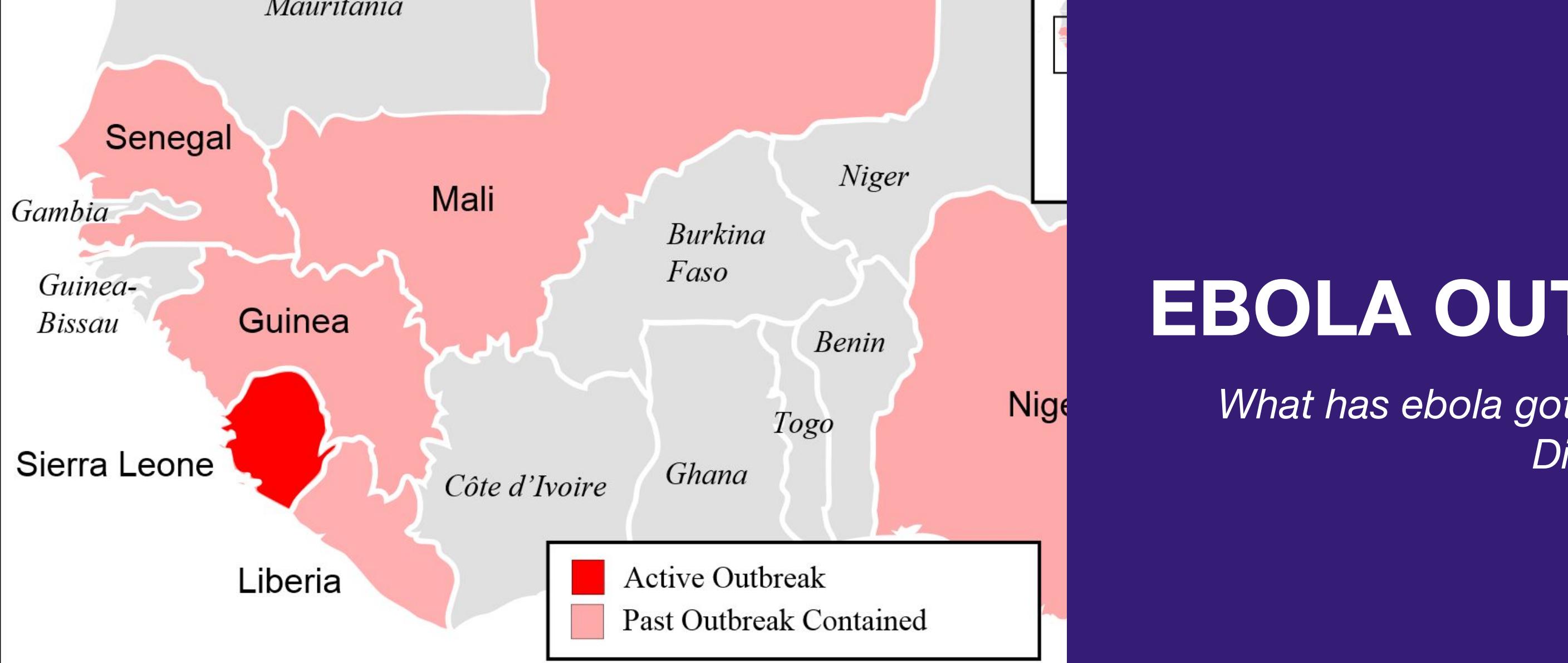
Taboos and denials can be handled on an ongoing basis so that change is more gradual

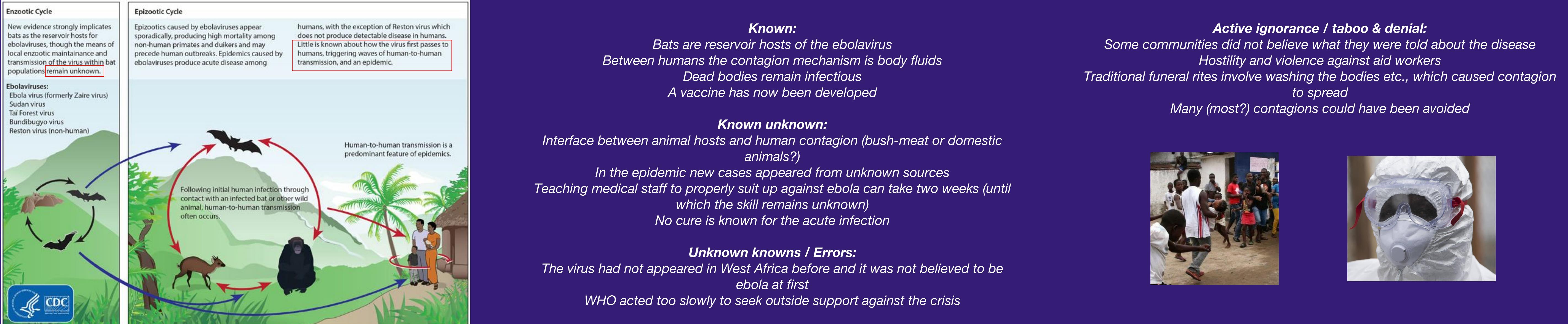
Benchmarking may be helpful in organizations

IGNORANCE CASE

Medical ignorance







Known:

Active ignorance / taboo & denial:

- Bats are reservoir hosts of the ebolavirus
- Some communities did not believe what they were told about the disease
- Between humans the contagion mechanism is body fluids
- Hostility and violence against aid workers
- Dead bodies remain infectious
- Traditional funeral rites involve washing the bodies etc., which caused contagion to spread
- A vaccine has now been developed
- Many (most?) contagions could have been avoided

Known unknown:

Interface between animal hosts and human contagion (bush-meat or domestic animals?)

In the epidemic new cases appeared from unknown sources

Teaching medical staff to properly suit up against ebola can take two weeks (until

which the skill remains unknown)

No cure is known for the acute infection

Unknown knowns / Errors:

The virus had not appeared in West Africa before and it was not believed to be ebola at first

WHO acted too slowly to seek outside support against the crisis

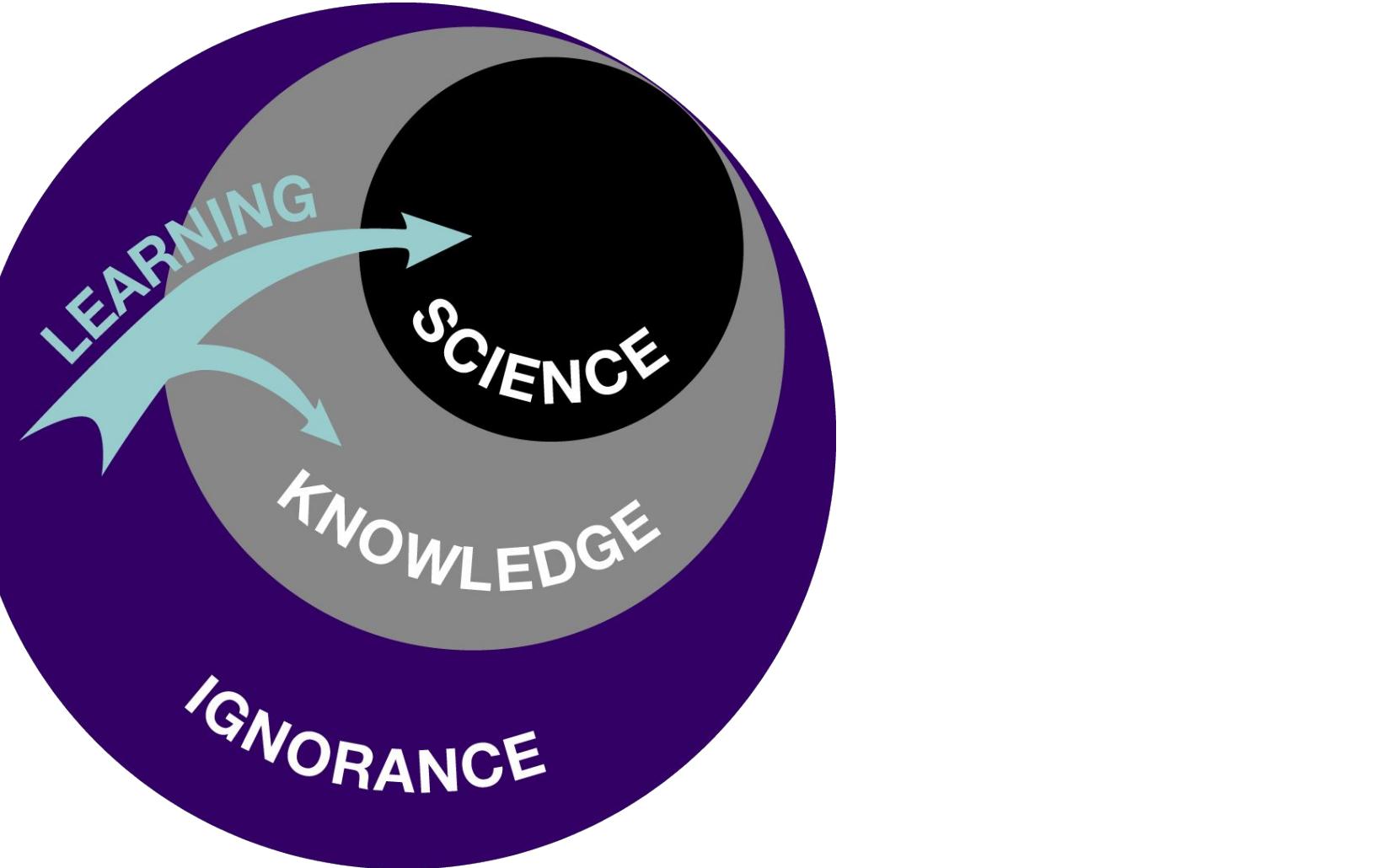


SUMMARY

Disclosing ignorance may be key to explain human behaviour and its impact on different systems

Ignorance explains behavior on individual and social system level

Ignorance is the raw material of knowledge and should not be seen only as negative!



CONCLUSION