

From Art to Science and Back Again

In Praise of Hybrids

The New Leonardos

Team Genius not Individual genius ?

Hybrid Teams

Transdisciplinary Teams



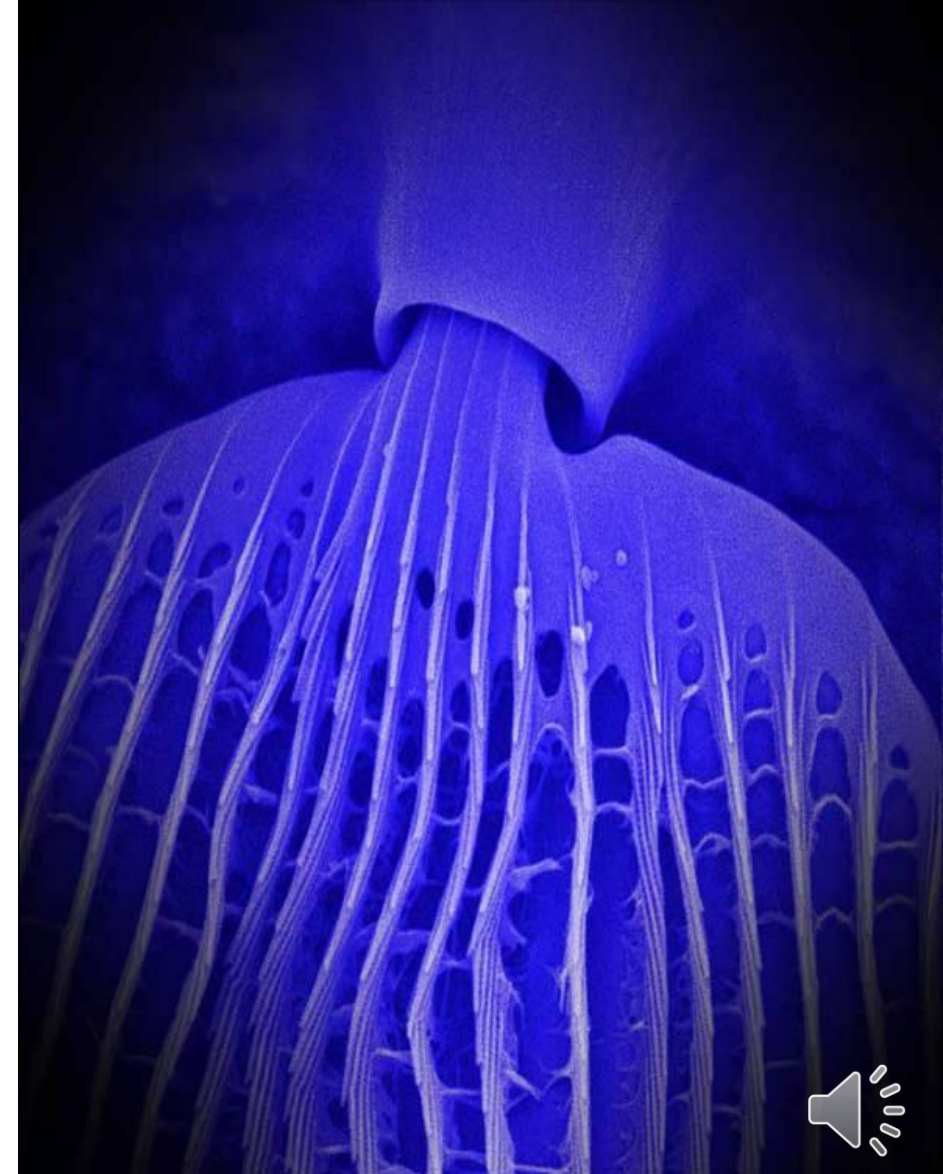
My context on e-science and art

- My first training is as a physicist and astronomer
- ArtScience is not new
 - Polymaths
 - Interdisciplinary Studies, Holistic, Integrative Studies
 - Problem based approaches
- Now , a group of us, we are art-science researchers
- I also work with colleagues as a publisher
- The Leonardo Publications at MIT Press



The Leonardo Organisations

- Journal Founded 1967 Paris; 50 years
- *For Scientists deeply engaged in the arts and humanities*
- *For Artists Seeking to appropriate science and technology for cultural purposes*
- *For scholars studying the interaction of the arts, sciences and technology*
- *Champions writing by artists and designers about their own work.*



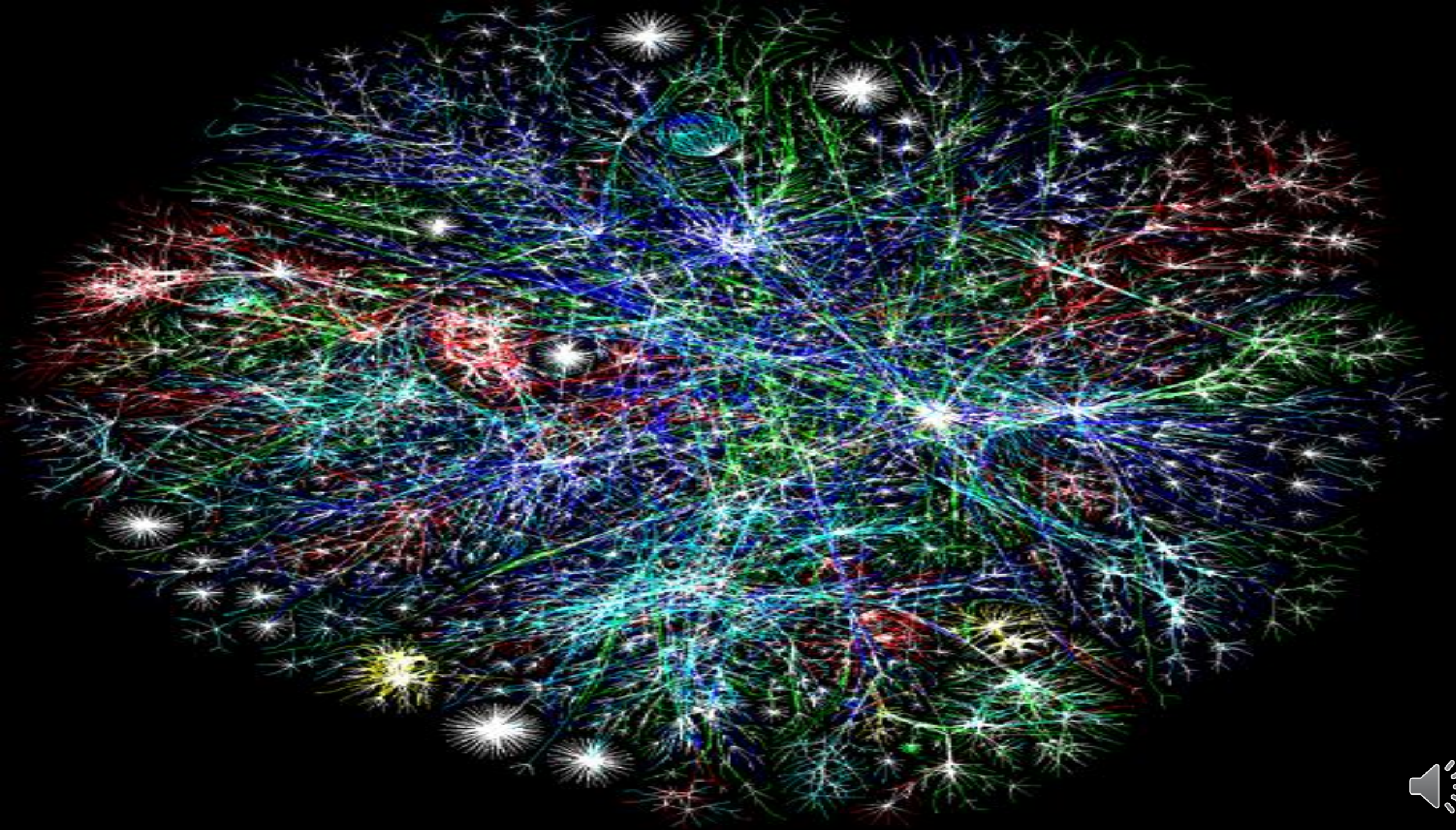
Why this astronomer and a human is unhappy today

- We are very badly designed to understand the universe
 - Our senses were developed to allow us to survive on earth- find food, procreate- but not to understand the world
- We have change our cultures quickly
 - In face of population growth, continuing wars
 - In face of pollution and destruction of the ecology we are tuned to
 - In face of climate change
 - In the past when societies faced such situation, they moved
 - **We have no where to move to...we must change our selves and our cultures**



- The key problems we are working with are very complex, and we must adapt quickly
- My parents after world war II helped set up UNESCO in 1947
 - Hoped the UN, WHO and other transnational organisations could change the world to prevent war, and spread well being
- Reluctantly I think we have failed to implement their vision
- **Perhaps the age of the individual genius is over**
- **We need to start the age of the team genius**
- And for this we need new ways of creating transdisciplinary collaborations.
- **We need to change our culture not just invent things.**
- don't think we know how to do this , I don't...
- **With projects like the Human Project in Santa Luzia we try ??**





- Enabling *new forms of collaboration* between **Science, Engineering, Medicine**
- **& Arts, Design and Humanities Today**



In Transdisciplinary Collaboration we need more hybrids and translators:

T Shaped Person



H Shaped Person

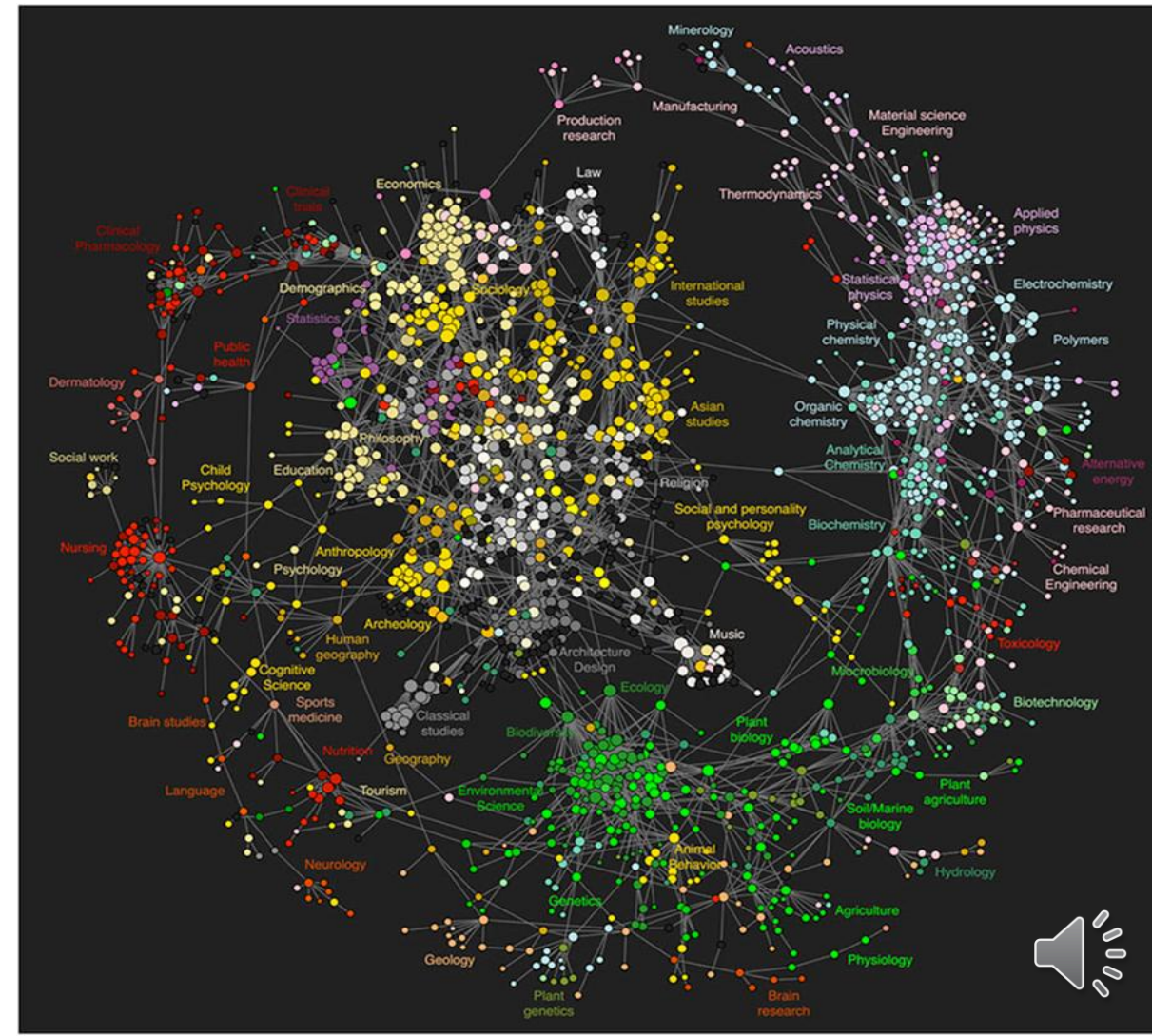


The power of framing metaphors

Tree of Knowledge



A dynamic Network of Knowledge



Changing our Metaphors as we enter the Data Culture



Change Our Metaphors

from the Tree of Knowledge to the Ecology of Knowledge

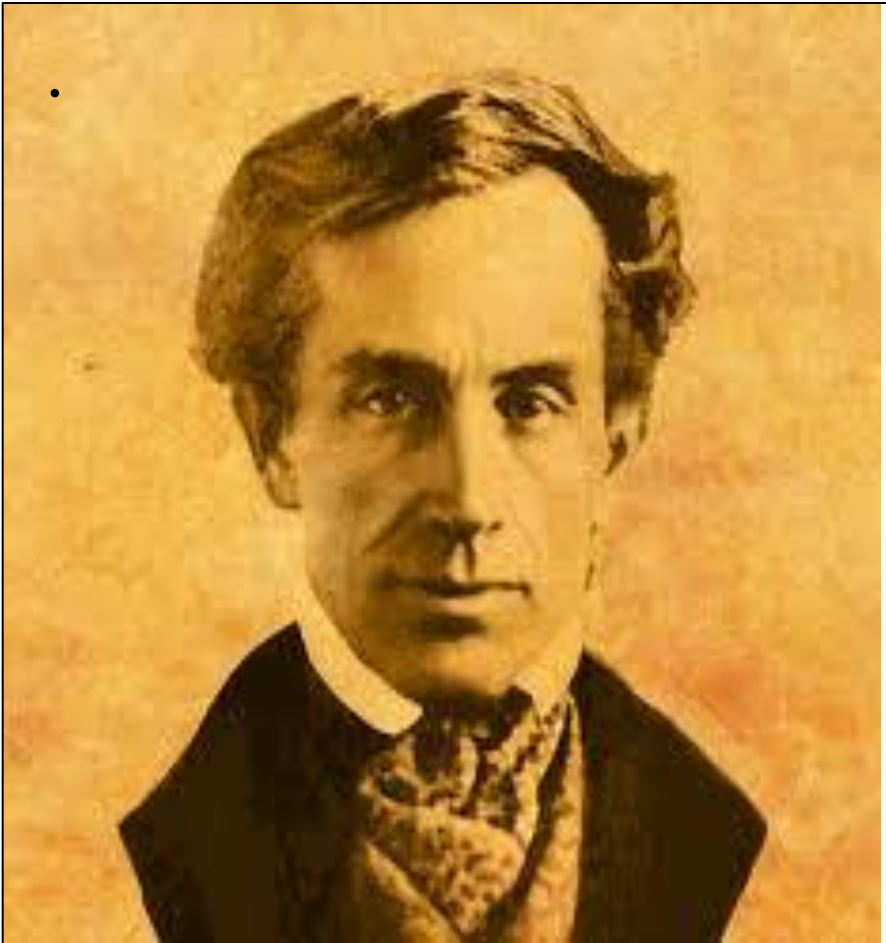


How Unusual are Hybrids ?

Samuel Morse

Landscape Painter

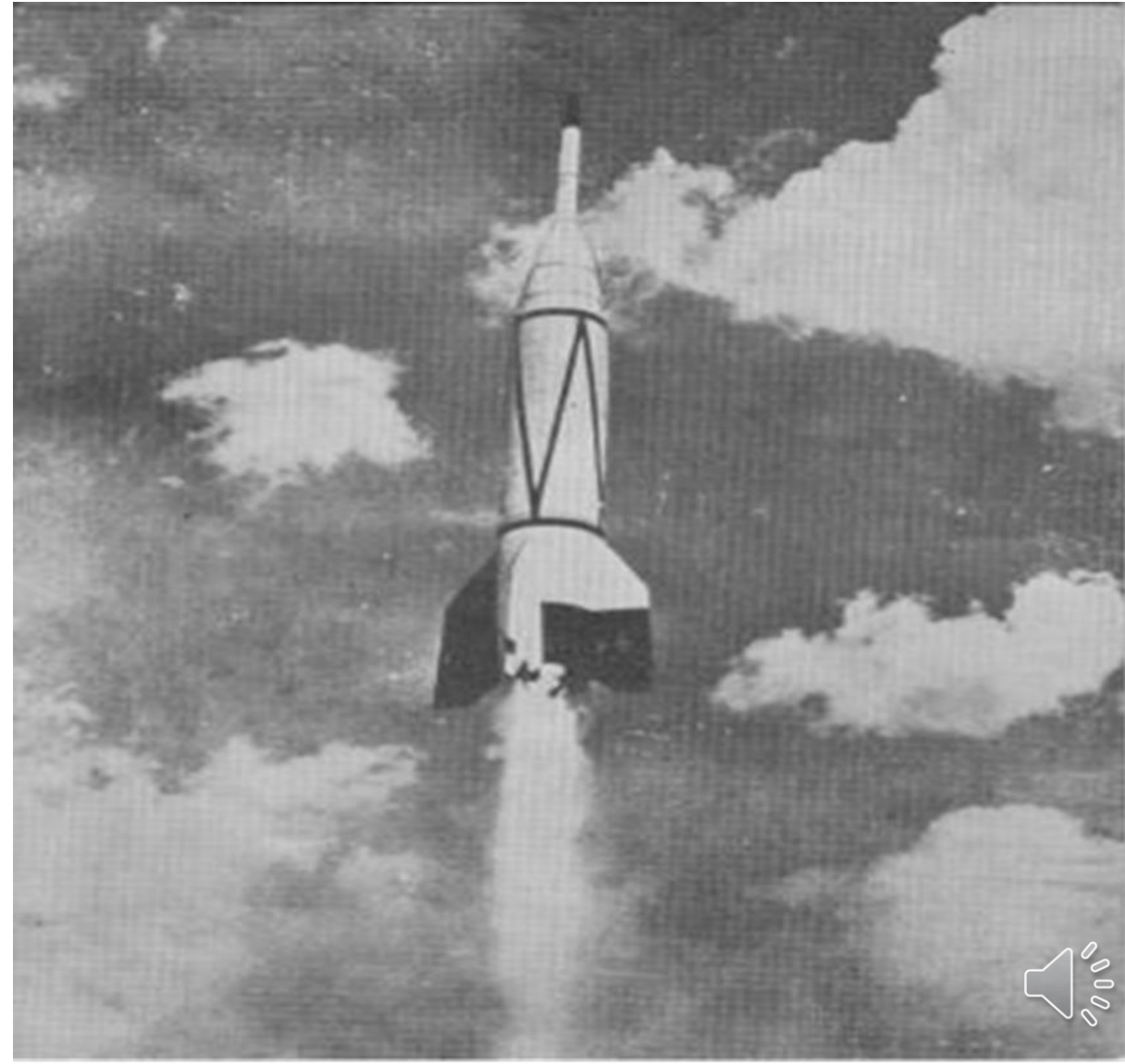
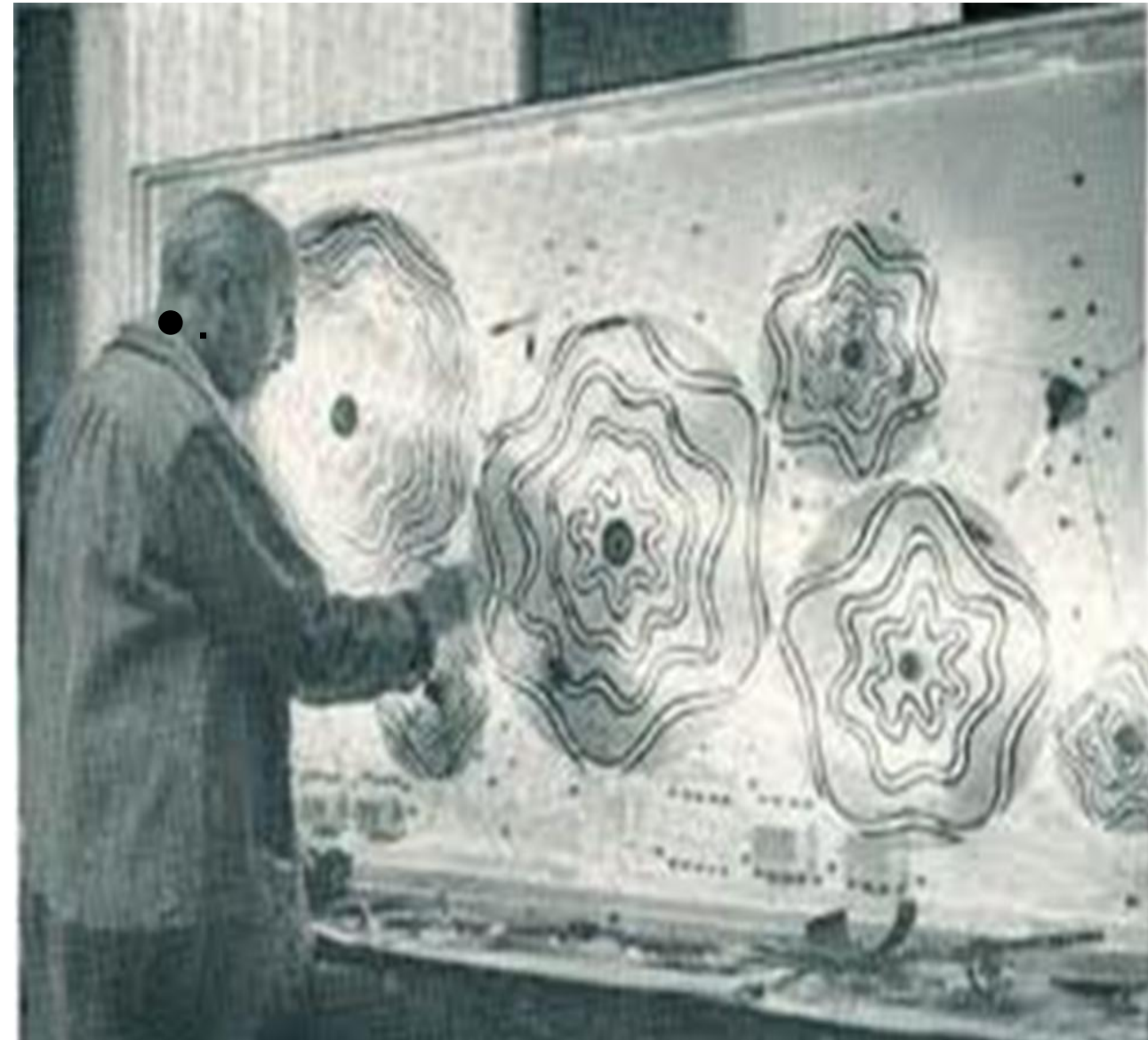
Morse Code



FRANK MALINA

Artist, Pioneer in Art and Technology

Rocket Pioneer, Co Founder NASA JPL



My Father was an art-science-engineering Hybrid

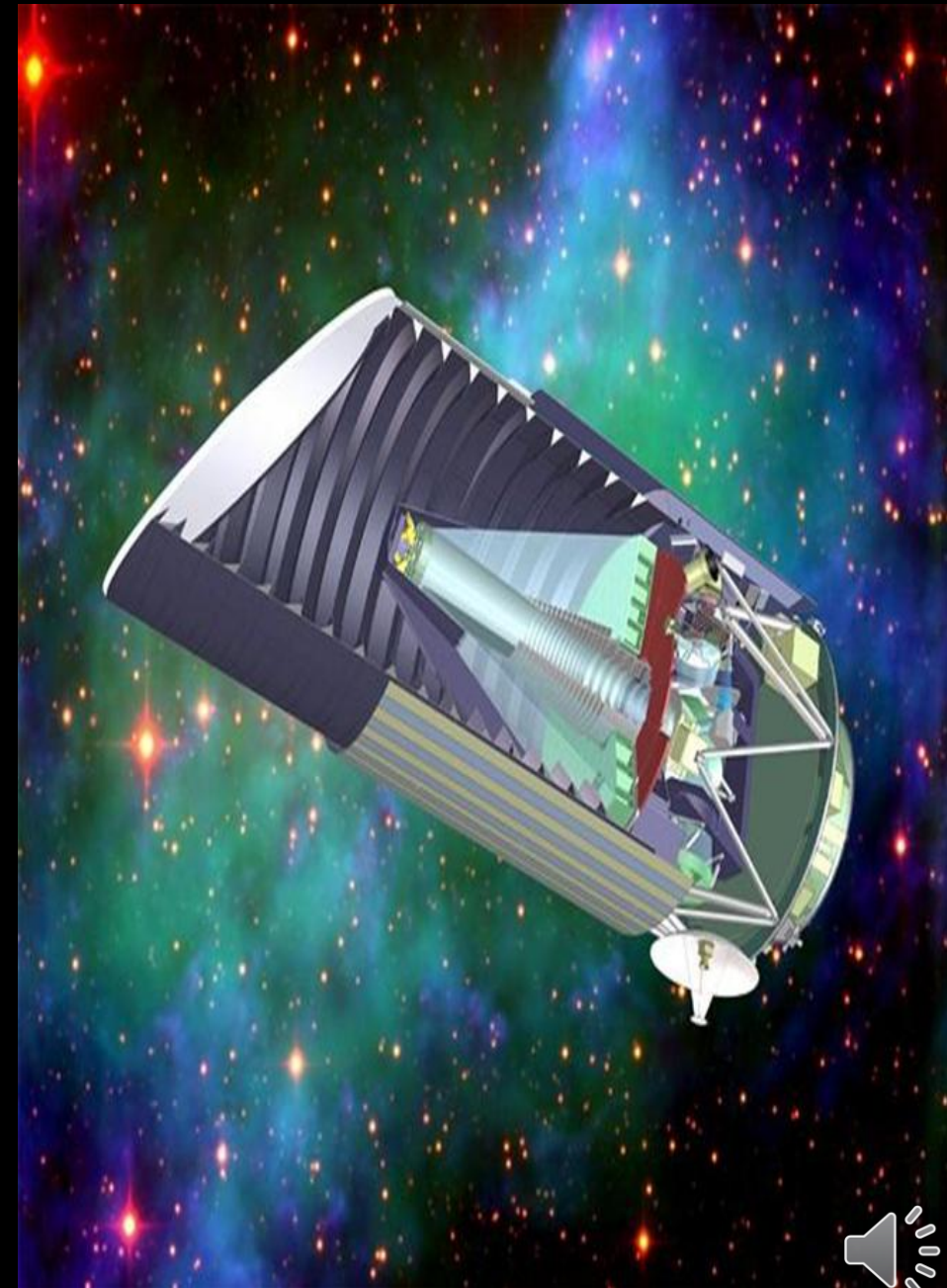


Now we need genius teams



My Career in Science

- Astrophysics
 - NASA Satellite
 - Telescope Development
 - Building new instruments to discover new things in the world
 - Just like artists build new artworks to make new expressions of their sense of the world
 - Our senses are very badly designed to understand the world



The world of data

- As a scientist
- The world of data is as real to me
- As the world of my direct senses
- But we are in the “stone age” of creating and exploring data worlds
- We need the work of artists and designers



DATA CULTURE

- *We have moved from a world of data scarcity to a world of data plenty*
- **1992: Historian Daniel Boorstin:**

150 years ago:

Meaning rich and data poor

Today :

Data rich and meaning poor.

Deep engagement with the arts, design, humanities needed to redesign culture
In the USA this is called “Stem to Steam”



ArtScilab @ ATEC, University of Texas at Dallas

- Opened 2013
- We work on research that requires collaboration between artists, scientists, engineers, humanities researchers
- Cultural Timeliness (why now ?)
- Societal Urgency (why should we care ?)
- Problem Driven Transdisciplinarity (why should we invest ?)
 - Interdisciplinary practices are expensive





A DATA “Forest” made from data about the inside of the brain ?

Listen for the frogs to find water?



CreativeDisturbance.Org

-Podcast driven,

multi-lingual – yes spanish too

Art/Sci/Tech Collaboration Platform
STEM TO STEAM

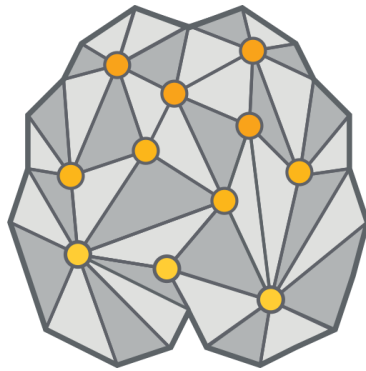
IF YOU WANT TO PUBLISH A PODCAST IN ANY LANGUAGE

We will be happy to work you

CR
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50
YEARS



LEONARDO
WHERE IDEAS
DON'T TAKE SIDES



AND NOW

- ?
- ?? ?? ??
- ?????????????????? ??
- ???
- **We look forward to working with you to think about the artscience context in Uruguay**
- **Some of my collaborators : Joao Silveira (Brazil), Alex Topete (Mexico) , Riccardo dal Farra (Argentina)....**



