

Making Science Intimate

The Scientific Method as a Territory for Artistic Experimentation

The LEONARDO Network: Artists and Scientists collaborating on the burning issues of our

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for

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Modern Science Doesn't Make Common Sense

Most knowledge about our world now comes through scientific instruments

Few people have experience of mediated senses

Much science is now done by experiments on data rather than experiments on the world

Most of the world isn't on human scales

Nano science

Femto physics

Our intuition, languages, metaphors, arts are built training on the wrong data for survival

New Senses: Gravitational Wave Observatories-  
LIGO in USA VIRGO in Italy

New senses: The Antares Neutrino Observatory under the Mediterranean

Modern Science does not Make Common Sense

We need a new sensuality

We need a new sociology of science

Most science is done in protected semi monastic enclaves

Science is a „Cargó Cult“

We need a new scientific revolution

We face burning issues in our times from climate change to globalisation

Science is largely disconnected from public needs

A NEW ARTSCIENCE CULTURE for RAPID TRANSFORMATION

The Evolving Scientific Method

Physical  $\rightarrow$  Laws  $\rightarrow$   $a$ :

Compact Descriptions of the World

Experiments on the world

Simulations:

Virtual Worlds that mimic our World

Retrodiction vs Prediction

Pattern Recognition:

The  $10^{15}$  petabyte  $10^9$  era

Doing experiments on data about the world

Extrapolation vs Explanation

The Evolving Scientific Method

The Mysterious Effectiveness of Mathematics

New mathematics: complexity theory, network theory

Computable worlds. Algorithms

Causality as an emergent property

The Mysterious Effectiveness of Instruments

Our Senses are Filters not Windows on the World

Other scales of size, time, other sources of energy

New Ontologies

Some aspects of the world cannot be understood until we have invented the right instru

The Scientific Method as a Territory for Artistic Experimentation

Forming intuition on mediated sensory data

Designing/Interacting with simulated systems

Making sense of dense data, petabyte era

Coupling the virtual world to the physical world

Making Science Intimate

Peoples Science

Micro Science

New Ontologies, New Intuitions, New Sensuality

Why Collaborate and Network ?

The burning issues of our times require us to work differently

Some hard problems require artists and scientists to work together

Coupling micro-science to cultural change

Existing social networks re-inforce old approaches and protect old values

The tyranny of geography and personal history

Our institutional structures reflect other ways of thinking

The LEONARDO organisations and networks: An evolving story, [Ä¶](#).

Leonardo an organisation founded in the 1960, [Äôs](#)

A generation of survivors of World War II

Creation of new international science organisations

A 1950 [Äòsocial contract,Äù](#) between science and government

Cultural appropriation of science and new technologies:

The [Äúweak case for art-science-techology interaction,Äù](#)

The birth of the digital arts

R and D budgets of game/entertainment now driving technology

And now,  $\mathbb{A}^{\mathbb{Q}}$ .?

$\neg \neg \rightarrow$  Ask Not What the Sciences can do for the Arts,  $\mathbb{A}^{\mathbb{Q}}$  Ask what the Arts can do for the

The  $\neg \neg \rightarrow$  Strong Case  $\neg \rightarrow \rightarrow^a$  for art-science-technology interaction

The  $\neg \neg \rightarrow$  Hard Humanities  $\neg \rightarrow \rightarrow^a$ : art ,  $\mathbb{A}$  itechno science collaboration as part of the tool I

Enabling and Promoting the New Leonardos

Leonardo Publications @ MITPRESS

30 books, 4/year

Leonardo Journals

eg: Art and Innovation

( XEROX PARC )

Immersed in Technology

(BANFF, Canada).

MA Moser/D MacLeod

Manovich: Language of New Media

Kac: Signs of Life: Art/Biology

DaCosta: Tactical Bio Media

Leonardo Organisation activities since 1967

Working Groups:

Leonardo Education Forum

Lovely Weather: Art and Climate Change

Workshops/Conferences:

Mutamorphosis (extreme environments), LESS REMOTE

Prizes and Awards

Collaborations :

ITACCUS Committee for Cultural Utilisation of Space,

YASMIN mediterranean rim network

REDCATSUR new latin american network

LASSI Leonardo Asian network

„Ä¶over 40 years we have promoted and documented the work of over 6000 New Leona

Muliple Modes to Mediated Sensuality

INTIMATE SCIENCE:

¬´¬† ownership of the data about ones own

environment¬†¬ª

Peoples Science: →' →↑public science→↑→<sup>a</sup>

OPEN OBSERVATORIES→↑:

→↑→<sup>a</sup> distributed and open science→↑→<sup>a</sup>

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Open Observatories:

Coupling Common Sense to Common Science

Micro-Science

Micro Science is to the National Science Foundation

What Micro Credit is to the World Bank

Making science intimate

Owning data about your own environment

Science creating communities own their knowledge

Building intuition, language from mediated sensory experience

Science- Art Projects and Art-Science Projects

Art driven use of scientific methods and instruments

Science driven development of cultural artifacts

The Sound of Trees Growing

David Dunn (composer, sound artist)

Jim Crutchfield ( complexity scientist)

Artist driven recording of sounds of trees growing led to research project in the coupling

Calm Technologies/Distributed Sensing/Locative Media

Weiner 1991 Xerox Parc

Eg Eric Paulos, Intel

[www.urban-atmospheres.net/CitizenScience](http://www.urban-atmospheres.net/CitizenScience)

active participation in basic scientific data gathering

richer, finer-grain data sets for modeling

mobile phone for grassroots participation in government and policy making

Trash Truck project

Intimate Science

Pigeon Blog ( B Da Costa) Inside Outside Handbag (Katherine Moriwaki )

Mediated Sensuality

1904 2004

Cezanne: Mont St Victoire.....Sabine Raaf: Translator II

New Corporality; Physical, Virtual

Stelarc Char Davies

Immersion in Extreme Environments

Antarctica.....Deserts,Ä¶

Marco Peljham and Macrolab

Hybrid Bodies

eg Marcel.li Antunez Roca in zero gravity

Nano Intuition :

feeling molecules

Sommerer/Mignoneau

Embedded in Peta-Data Sets

Donna Cox Ruth West

Weather Data Bases Protein Sequence Data

Linking the Virtual and Physical Worlds:  
Ground Truth

Andrea Polli Sarah Jane Pell

People,Âs Science

Bharat Gyan Vigyan Samiti: Indian People,Âs Science Networks

Brazil Digital Culture projects

Sergipe ñ´ ñ†Human Projectñ†ñª

Humbi Umbi in Brazil

Srishti School, Bangalore

Ubiquitous micro science producing communities

Open Hardware

Hacker Culture, Bricolabs

OPEN OBSERVATORIES

Crowd-Sourcing

Distributed Science

BOINC : Berkeley Open Infrastructure Network Computing

SETI@home search for extraterrestrial intelligence

climateprediction.net , climate modelling

malariacontrol.net

Philanthropy 2.0:

→ ' → † open innovation → † → ¢

Eg INNOCENTIVE

Organisations can submit problems for solution

Together with award incentive

Over 200 problems solved to date

Problem solving communities outside the Academy

Eg [www.fundscience.org](http://www.fundscience.org)

How

Artists in Labs

Scientists in Studios

Town Scientists

Micro Science funding

Open sourcing of data about your own world OPEN OBSERVATORIES

Developing the „Ähard humanities,Äô to change the content and direction of science

ArtsActive Network

Artists in R and D Labs Programs

[www.artsactive.net](http://www.artsactive.net)

Art in Labs, Switzerland, Jill Scott

ANAT/Synapse,

Symbiotica Australia

Dissonancias, :Laboral, Spain

Art and Genomics: Holland

ECTOPIA; Portugal

FUSE/CADRE: .Climate Clock

UK ITEM, ArtsCatalyst, FACT/ Blue Sky Residencies

Leonardo - UCB Space Sciences

Leonardo/POP SUD France

TRANSGENESIS; Czech rep

Observers: James Leach, Emmanuel Mahe (Orange), Bronac Ferran, Sammuelle Carlson

List of patents filed by artists

Exchange of Intellectual Property approaches

Jurying systems

Announcements

Scientists in cultural organisations ?

Thanks

[www.olats.org](http://www.olats.org)

[www.leonardo.info](http://www.leonardo.info)

[rmalina@prontomail.com](mailto:rmalina@prontomail.com)

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d

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Sciences → ⑧, Ä ¶. Roy Ascott

kit for building a sustainable world, Ä ¶. burning issues, Ä ¶

irdos



g of ultrasound from trees, beetles, forest fire system dynamics





1. Robert Thill