Gothenburg, November 21 2022

Lecture for PhD students

RESEARCH ETHICS

relevant for AI/ML systems

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ethics
Metaethics
problems
made
good
study
time
find
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approached
sub-branches
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Along
coerce
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Automation and Ethics

47. Automation and Ethics

Srinivasan Ramaswamy, Hemant Joshi

Should we trust automation? Can automation cause harm to individuals and to society? Can individuals apply automation to harm other individuals? The answers are yes; hence, ethical issues are deeply associated with automation. The purpose of this chapter is to provide some ethical background and guidance to automation professionals and students. Governmental action and economic factors are increasingly resulting in more global interactions and competition for jobs requiring lower-end skills as well as those that are higher-end endeavors such as research. Moreover, as the Internet continually eliminates geographic boundaries, the concept of doing business within a single country is giving way to companies and organizations focusing on serving and competing in international frameworks and a global marketplace. Coupled with the superfluous nature of an Internet-driven social culture, the globally-distributed digitalization of work, services and products, and the reorganization of work processes across many organizations have resulted in ethically challenging questions that are not just economically, or socially sensitive, but also highly culturally sensitive. Like the shifting of commodity manufacturing jobs in the late 1900s, standardization of information technology and engineering jobs have also accelerated the prospect of services and jobs more easily moved across the globe, thereby driving a need for innovation in design, and in the creation of higher-skill jobs. In this chapter, we review the fundamental concepts of ethics as it relates to automation, and then focus on the impacts of automation and their significance in both education and research.

Ramaswamy S., Joshi H. (2009)

Automation and Ethics.

In: Nof S. (eds) Springer

Handbook of Automation.

Springer, Berlin, Heidelberg

Topics with Ethics Relevance
(That PhD students Identified Before)

Technology Aspects

Data-related

- D*ata provenance (attribution, background)*
- Data confidentiality
- Data privacy
- Public understanding of technology and protection of private data
- Data quality, property and equality
- Data-driven approaches
- Reproducibility of real time datasets
- Data is never ”neutral”
- Data collection influences behavior
- Data-streching used in political purpose
- security and reliability of the IoT devices
- ”Surplus data” from screening of patients that can reveal much more
- Transparency vs. quality

Sustainability-related

- Fuel economy, lower emissions, reduced take-off and landing noise
- Environmental contributions of battery production, use and disposal
- Environmental impact of massive electronic production
- Increasing demand of rare elements
- Lack of life cycle assessment
- Rebound effect
- Digital sustainability?

Topics with Ethics Relevance

Methodology Aspects

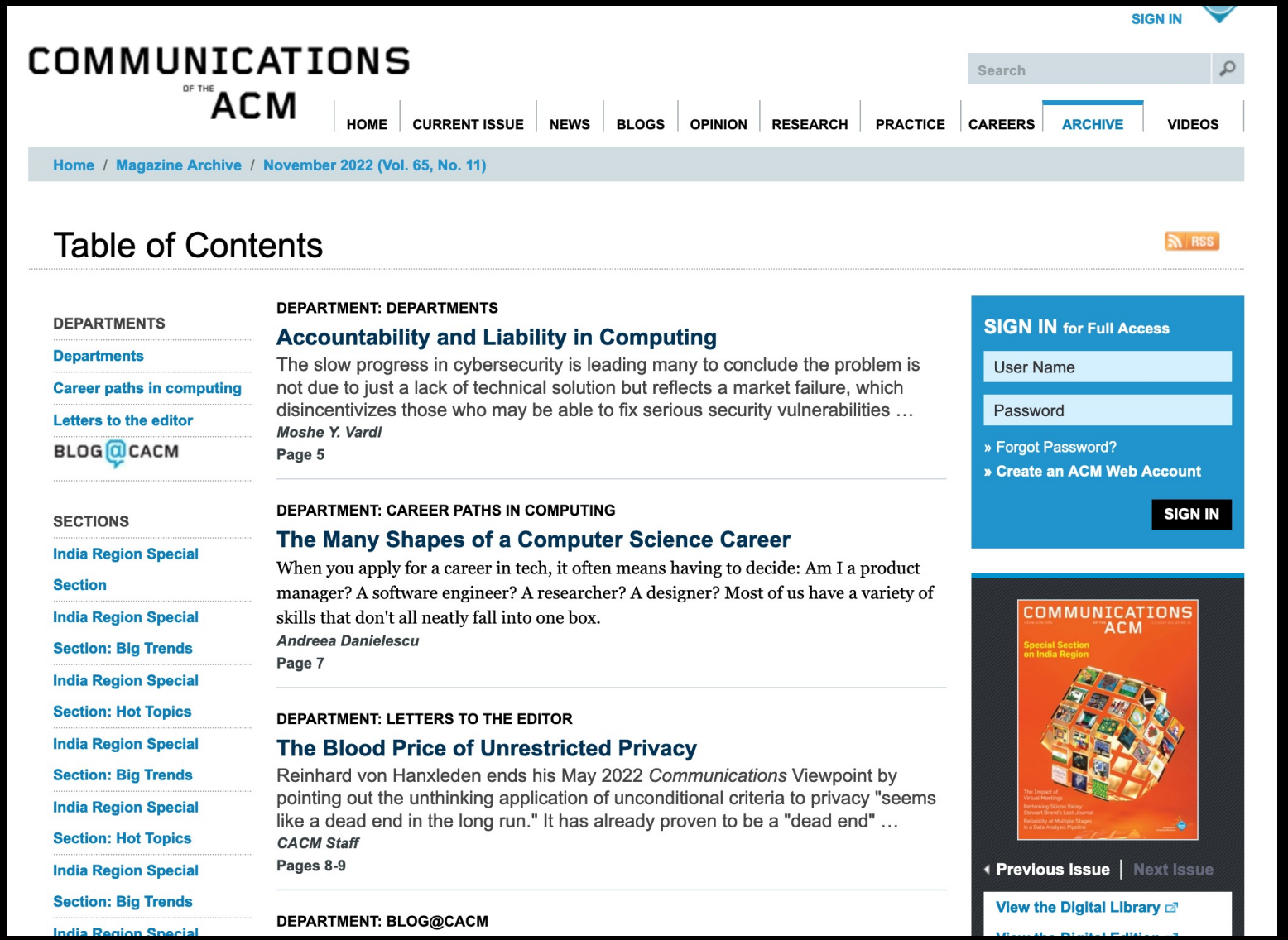
- Values
- The method
- Epistemic problems related work - acknowledging its limitations
- Reducing reality into a model, with loss of depth and variety of perspectives?
- Marginalizing the designer in the design process?
- Level of transparency is acceptable for an automated tool?
- Should we rely on automated tools if we consider the intrinsic limits of the learning process?
- Data-driven development methodology
- genetic discrimination
- genetic modification/engineering
- Tradeoff between safety and innovation
- OPEN SCIENCE
- Simulation compared to real experiments
- Making connection between qualitative and quantitative information
- Application of the complex system in Landscape studies
- Reproduciblility
- System's performance almost always evaluated in isolation [QUESTION OF INTERPRETATION OF RESEARCH RESULTS]
- Authors do not verify their results thoroughly enough, or they hide complications
- THE REVIEW PROCESS IS NOT DOUBLE-BLIND
- Presentation of results (overemphasizing of their importance)
- Value of an intervention compared to other applications

Topics with Ethics Relevance

Social Aspects

- Cultural diversity
- Professional conduct
- Gender equality
- Quality of life
- Impact of technology on society at large
- Is the purpose of the analysis relevant enough to expose the users to privacy loss?
- Designing technology that could reduce the need for human employees?
- Entrusting the machine to define culturally relevant spaces for our cities?
- Legal issues related to copyright infringement
- Involving stakeholders/users
- Trust between stakeholders?
- Professional societies/organisations and
- Codes of Ethics
- Popular presentation of research and public opinion about research
- Informing the politics about possibilities and challenges of research

CACM November 2022



https://cacm.acm.org/magazines/2022/11

CACM August 2018

- INFORMATICS EUROPE AND ACM EUROPE COUNCIL Regulating Automated Decision Making
- CERF'S UP Traceability -workshop on cybersecurity was how to preserve the freedom and openness of the Internet while protecting against the harmful behaviors
- LETTERS TO THE EDITOR Encourage ACM to Address U.S. Election Integrity
- In the spirit of Moshe Y. Vardi's call for ACM to ". . . be more active in addressing social responsibility issues raised by computing technology," we urge the ACM U.S. Public Policy Council to undertake a study of the technological …*CACM Staff*
- BLOG@CACM Assessing Responsibility for Program Output
- We lack an easy way to indicate that algorithms do not make decisions and are not biased; programmers do, and are. *Robin K. Hill*
- Animals Teach Robots to Find Their Way
- Navigation research demonstrates bio-machine symbiosis. *Chris Edwards*
  Electronics Are Leaving the Plane Stacking chips and connecting them vertically
- Broadening the Path for Women in STEM - Organizations work to address 'a notable absence of women in the field.'*Esther Shein*
- GLOBAL COMPUTING Designing Sustainable Rural Infrastructure Through the Lens of OpenCellular
- EDUCATION Providing Equitable Access to Computing Education
- Seeking the best measures to reach advantaged and less-advantaged students equally. *Mark Guzdial, Amy Bruckman*
- COLUMN: KODE VICIOUS Every Silver Lining Has a Cloud

https://cacm.acm.org/magazines/2018/8

POINT/COUNTERPOINT: DEMOCRACY AND E-DEMOCRACY

- Point: Foundations of E-Democracy

Considering the possibility of achieving an e-democracy based on long-established foundations that strengthen both real-world democracies and virtual Internet communities. Ehud Shapiro

- Counterpoint: E-Democracy Won't Save Democracy. Democracy Will Save Democracy

Increased technology is not the solution to the fundamental issue of declining democratic culture. Douglas Schuler

PRACTICE Algorithms Behind Modern Storage Systems

Different uses for read-optimized B-trees and write-optimized LSM-trees. Alex Petrov

Research for Practice: Prediction-Serving Systems

- What happens when we wish to actually deploy a machine learning model to production? Dan Crankshaw, Joseph Gonzalez, Peter Bailis

- Consistently Eventual
- For many data items, the work never settles on a value. Pat Helland
  CONTRIBUTED ARTICLES How to Teach Computer Ethics through Science Fiction

- Science fiction in particular offers students a way to cultivate their capacity for moral imagination. Emanuelle Burton, Judy Goldsmith, Nicholas Mattei

- Queueing theoretic models can guide design trade-offs in systems targeting tail latency, not just average performance.Christina Delimitrou, Christos Kozyrakis
  Pages 65-72SECTION: REVIEW ARTICLESMultiparty Privacy in Social Media

- Online privacy is not just about what you disclose about yourself, it is also about what others disclose about you. Jose M. Such, Natalia Criado

- SECTION: RESEARCH HIGHLIGHTS Technical Perspective: Graphs, Betweenness Centrality, and the GPU

- "Accelerating GPU Betweenness Centrality" by McLaughlin and Bader

- We present a hybrid GPU implementation that provides good performance on graphs of arbitrary structure rather than just scale-free graphs as was done previously.Adam McLaughlin, David A. Bader

- COLUMN: LAST BYTE Deadlock

- Upgraded with new instructions, my AI aims to debug its original programmer, along with his home planet. William Sims Bainbridge

Why I do not talk about Ethical dilemmas

Naming decision situations dilemmas underlines the impossibility to find an ideal (perfect, unique and provable) solution.

However, engineering requires decision-making in the real world where the solution is the best available solution under given circumstances.

Our ambition is to assure best available solutions in a given context, and to justify our decisions/choices.

The topic is huge

What this lecture can do is to open the window with a view

https://www.flickr.com/photos/mercolino/3424888900

Introduction to Ethics

Facing Grand Challenges

"The global community is facing **Grand Challenges**. The European Knowledge Society must tackle these through the best analysis, powerful actions and increased resources. Challenges must turn into sustainable solutions (…) " The Lund Declaration, 2009 [1]

Natural challenges: Global warming, Insufficient supplies of energy, water and food, Ageing societies, Public health, pandemics, Security, Environmental degradation

Unintended consequences of technology: AGI (artificial general intelligence), Nano-technology, Biotechnology/Bioinformatics, Autonomous machinery and control: Big data, Internet of things – internet of everything, Intelligent cities, Autonomous cars, Autonomous intelligent software as control physical systems, information systems etc.

…

The Centre for the Study of Existential Risk (University of Cambridge; http://cser.org

Education of new generations of engineers often focus on training abstract skills without careful consideration of the role of embeddedness of technology into context.

CODE OF CONDUCT

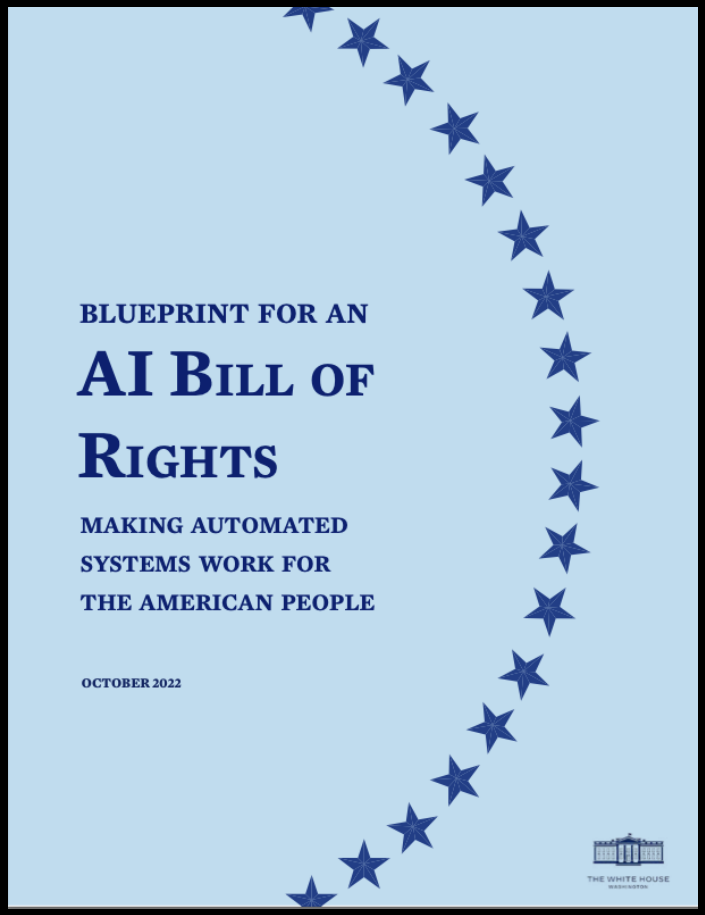
The European Science Foundations Code of Conduct for Research Integrity
https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020-ethics_code-of-conduct_en.pdf

Future Intelligent Autonomous Systems

The IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems

http://standards.ieee.org/develop/indconn/ec/autonomous_systems.html

Prioritizing human well being in the age of artificial intelligence: https://youtu.be/z5yZU8tp9W8 (5:56)



The AI Bill of Rights outlines principles, including that people have a **right to control how their data is used** and to **not be discriminated against by unfair algorithms**.

It is a white paper, which does not have the force of law. It's primarily aimed at the federal government and could influence **which technologies government agencies acquire**, or help parents, workers, policymakers, and designers **ask tough questions about artificial intelligence systems**.

However, it can't constrain large tech companies, which arguably play a bigger role in shaping future applications of AI.

https://www.whitehouse.gov/wp-content/uploads/2022/10/Blueprint-for-an-AI-Bill-of-Rights.pdf

Responsible Research and Innovation

Global challenges and opportunities prompted Responsible Research and Innovation (RRI), defined as:

"*a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society).*"

Von Schomberg

Education of future engineers should follow!

Facing Grand Challenges: The University of the Future

The transformation of "ivory tower" context-independent to socially-aware paradigm in increasingly information-rich knowledge-based societies.

The triple helix model connects:

–ACADEMIC

–INDUSTRY/BUSINESS

–GOVERMENT

https://inquiryumn.files.wordpress.com/2014/09/triple-helix.png

Inspired by biology: THE TRIPLE HELIX
Gene, Organism, and Environment by Richard Lewontin

Science with and for Society Work Programme

Societal challenges for the 2020 are formulated in the Science with and for Society work programme, meant to

"help build effective cooperation between science and society, to recruit new talent for science and to pair scientific excellence with social awareness and responsibility"

This new approach encourages all stakeholders (involved citizens, researchers, business, policy makers, etc.) to interact throughout the research and innovation process and to coordinate and align both the process and its outcomes with societal values and needs, in accordance with Responsible Research and Innovation (RRI).

Societal values and needs: sustainability, safety, privacy, equity, diversity, etc.

https://ec.europa.eu/programmes/horizon2020/en/h2020-section/science-and-society

Organizational Adaptation in the Era of Complexity and Continuous Change

A necessity of defining social/organizational responsibility in addition to customary personal responsibility [7].

We should take into account both intended and unintended consequences of research and technology in a preferably *anticipatory and learning process* that will in the first place prevent incidents and accidents and in the worst case *mitigate* their consequences, [8-13].

Contemporary global society is organized in networks of networks of interacting agents. Each individual belongs to a variety of networks, which define their different roles as stakeholders in various aspects of research and technology. In this context complexity and trans-disciplinarity /inter-disciplinarity comes as an important aspect of research and development.

Values, priorities, actions are negotiated by stakeholders, globally.

Educating Engineers for the Future

We are educating engineers that will solve future problems

Future is already at our doors: it comes in form of digitalisation that is going to radically change our technology and society

Choices are made all the time in the design and engineering and sensitivity to consequences of choices is needed – involves moral judgment.

Terminological Clarification: Ethics and Morality

The terms ethics and morality are often used interchangeably - indeed, they usually can mean the same thing, and in everyday conversation there isn't a problem with switching between one and the other.

However, there is a distinction between them in philosophy!

Ethics and Morality, Etymology

Morality and ethics have the same roots, *mores* which means manner and customs from the Latin and *etos* which means custom and habits from the Greek. (Robert Louden, Morality and Moral Theory)

Strictly speaking, morality is used to refer to what we would call *moral conduct* while ethics is used to refer to the *formal study of moral conduct*.

Ethics is also often called *moral philosophy*.

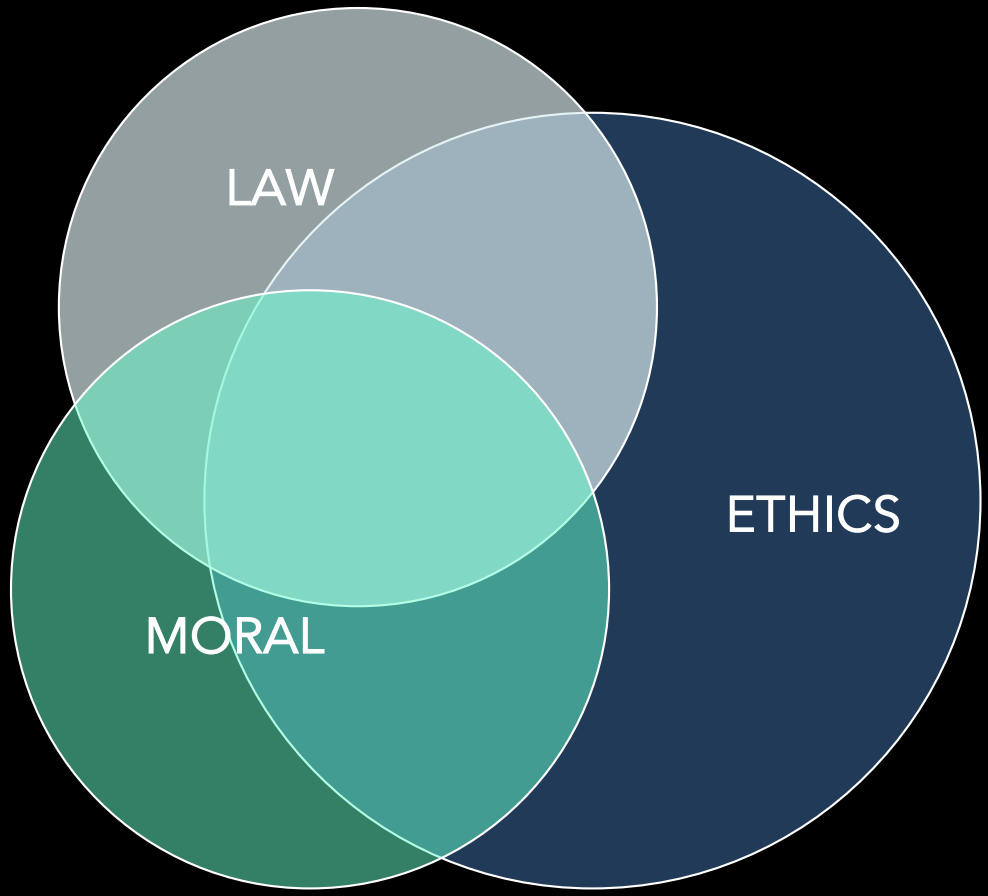
Ethics and Morality, in Short

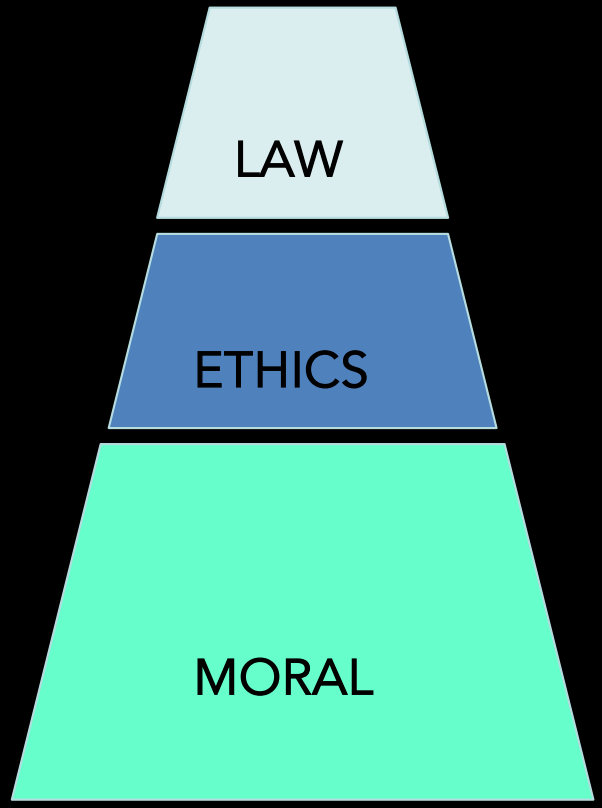
- MORALITY - PRACTICE: first-order set of beliefs and practices about how to live a good life.
- ETHICS - THEORY: a second-order, conscious reflection on the adequacy of our moral beliefs.

In a presentation at Chalmers in October 2015, ethicist Prof. Ibo van de Poel from TU Delft in the Netherlands suggested that the students need to develop the following "moral competences":

- Moral sensibility
- Moral analysis skills
- Moral creativity
- Moral judgment skills
- Moral decision-making skills
- Moral argumentation skills

Societal Normative Systems





Ethics as Continuum
- An Ongoing Conversation

- World changes constantly, and we have to interpret/construe it over and over again.
- We come back to ideas again and again, finding new meaning in them.
- Professional discussions of ethical issues in journals.

See http://www.utm.edu/research/iep/e/ethics.htm Ethics

What to Expect from Ethics

Functions of theory:

- Describe (What?)
- Explain (Why?)
- Prescribe (How?)
- Support (Yes, we can!)
  - Open new possibilities and insights
  - Wonder – move on exploring ethical aspects

On what Ethical Basis do People Typically Make Moral Decisions?

- Divine Command Theories
- Utilitarianism (Consequentialism)
  The action is best, which procures the greatest happiness for the greatest number…
- Virtue Ethics
  Maximize virtue, minimize vices

On what Ethical Basis do People Make Moral Decisions?

- **The Ethics of Duty** (Deontological* Ethics)
  - Immanuel Kant's Moral Theory. The categorical imperative: -- "Act so that the maxim [determining motive of the will] may be capable of becoming a universal law for all rational beings."
- **Ethical Egoism**
  - Ayn Rand, The Ethics of Selfishness

    Well known for her novels, especially, Atlas Shrugged
  - "Macciavelism" – "The end justifies the means"
    Nicollo Macchiavelli (The Prince) - rationalization of war

* 'deon' = duty

On what Ethical Basis do People Make Moral Decisions?

- The Ethics of Natural and Human Rights – all people are created ...with certain basic rights
- Social Contract Ethics (We agree to be civil to one another under threat of punishment from a government established for this purpose. [Plato, Republic. Thomas Hobbes])
- Evolutionary Ethics – Being social increases our chances to survive

POLICY VACUUMS – ETHICS OF PRESENT DAY TECHNOLOGY AND DEVELOPING SOCIETY – EXAMPLE OF COMPUTER ETHICS

"A typical problem in computer ethics arises because there is a policy vacuum about how computer technology should be used. Computers provide us with new capabilities and these in turn give us new choices for action. Often, either no policies for conduct in these situations exist or existing policies seem inadequate. A central task of computer ethics is to determine what we should do in such cases, i.e., to formulate policies to guide our actions. Of course, some ethical situations confront us as individuals and some as a society. Computer ethics includes consideration of both personal and social policies for the ethical use of computer technology."

Moor, J, 1985. "What is Computer Ethics", Metaphilosophy 16(4): 266-75.http://www.cs.ucdavis.edu/~rogaway/classes/188/spring06/papers/moor.html

VALUES AND ETHICS

VALUES AND ETHICS IN KNOWLEDGE PRODUCTION

Based on the article:

Nancy Tuana (2015)
Coupled Ethical-Epistemic Analysis in Teaching Ethics. Critical reflection on value choices.
CACM VOL. 500 NO. 12. Pages 27-29

http://cacm.acm.org/magazines/2015/12/194630-coupled-ethical-epistemic-analysis-in-teaching-ethics/abstract

ETHICAL-EPISTEMIC* ANALYSIS

How values and priorities affect knowledge production

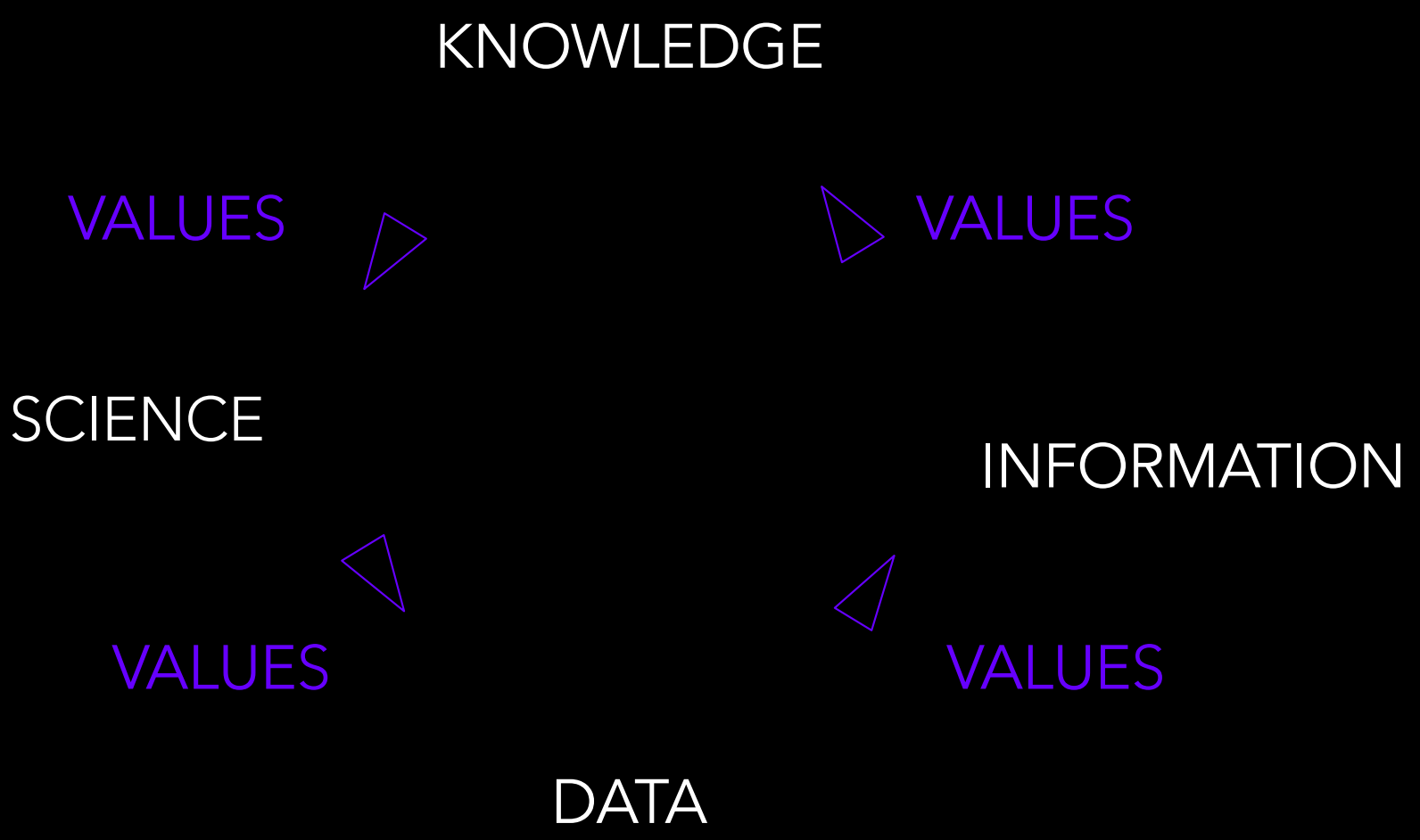
"Computer experts aren't just building and manipulating hardware, software, and code, they are building systems that help to achieve important social functions, systems that constitute social arrangements, relationships, institutions. computer experts can facilitate and constrain behavior, and materialize social *values.*"

Deborah Johnson

Values serve as a guide to action and knowledge.

Epistemology-the branch of philosophy concerned with the nature and scope of knowledge.

Values in Knowledge Production



VALUES

Values serve as a guide to action and knowledge. They are relevant to all aspects of scientific and engineering practice, including discovery, analysis, and application.

Cognitive scientists have found values to be integral parts of STEM (Science, Technology, Engineering, and Mathematics) research.

TYPES OF VALUES

Various types of values can be involved in decision making and reasoning:

- ethical values (the good of society, equity, sustainability)
- *aesthetic* values (simplicity, elegance, complexity), or
- *epistemic* values (predictive power, reliability, coherence, scope).
- *economic* values, etc.

Code of Conduct for Research Integrity
Basic Principles - Values

Reliability in ensuring the quality of research, reflected in the design, the methodology, the analysis and the use of resources.

Honesty in developing, undertaking, reviewing, reporting and communicating research in a transparent, fair, full and unbiased way.

Respect for colleagues, research participants, society, ecosystems, cultural heritage and the environment.

Accountability for the research from idea to publication, for its management and organisation, for training, supervision and mentoring, and for its wider impacts

The European Science Foundations Code of Conduct for Research Integrity
https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020-ethics_code-of-conduct_en.pdf

Values Related to Risks

- Reliability
- Safety
- Security
- Privacy
- Human well-being

Book: **Computer-Related Risks** by Peter Neumann (Addison-Wesley 1994; ACM Press Series)

VALUES IN RESEARCH – CHOICES WE MAKE

- The selection of research topics. What is a good basis for

(We get involved with existing research. Or we get funding for a specific research. Or we choose freely. Why is this research worth our time and effort?)

- Choice of approach, methodology, tools. What are the values of a model, hypothesis, or theoretical explanation in providing convincing explanation?

- Judgment of the support for a research result. What values of evidence constitute robust evidence?

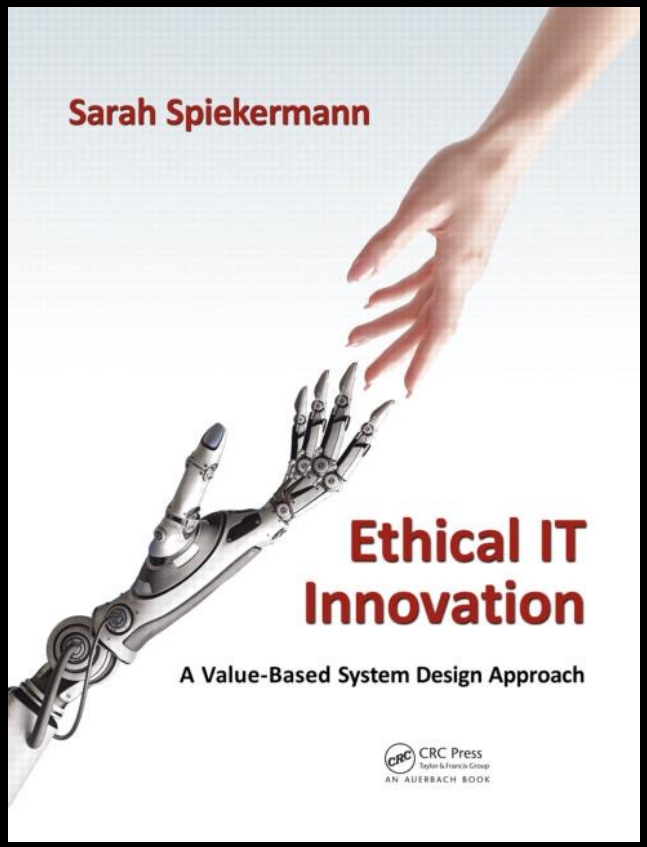
- How are ethical aspects of research taken care of?

REQUIREMENT FOR TRANSPARENCY OF VALUES

Transparency of values is essential for trustworthiness and credibility of research. It is central to transdisciplinary research such as e.g. the National Science Foundation's Sustainability Research Network on Sustainable Climate Risk Management (SCRiM, http://scrimhub.org).

Coupled ethical-epistemic analysis helps to identify new and refined research topics, and inform modeling for multi-objective, robust decision making.

Ethical IT Innovation: A Value-Based System Design Approach

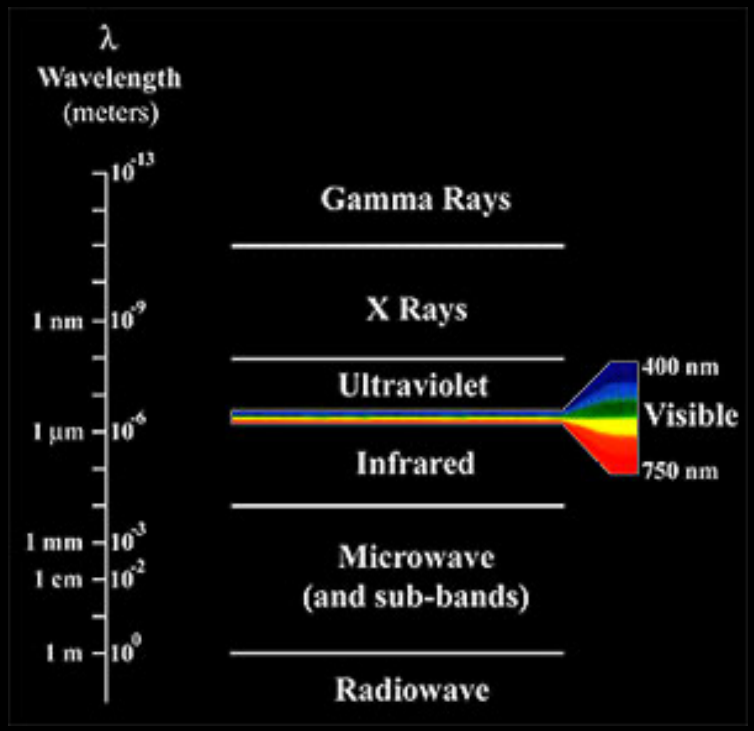


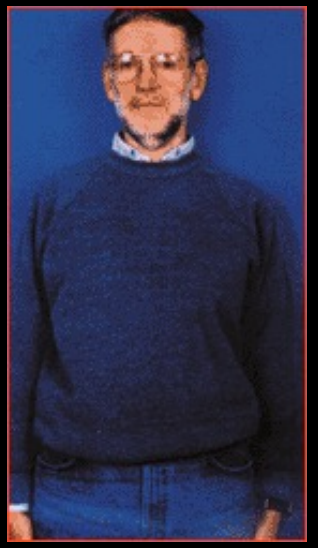
Sarah Spiekermann:

IEEE P7000
The first global standard process for addressing ethical concerns in system design

https://www.crcpress.com/Ethical-IT-Innovation-A-Value-Based-System-Design-Approach/Spiekermann/p/book/9781482226355#googlePreviewContainer

World seen in different light

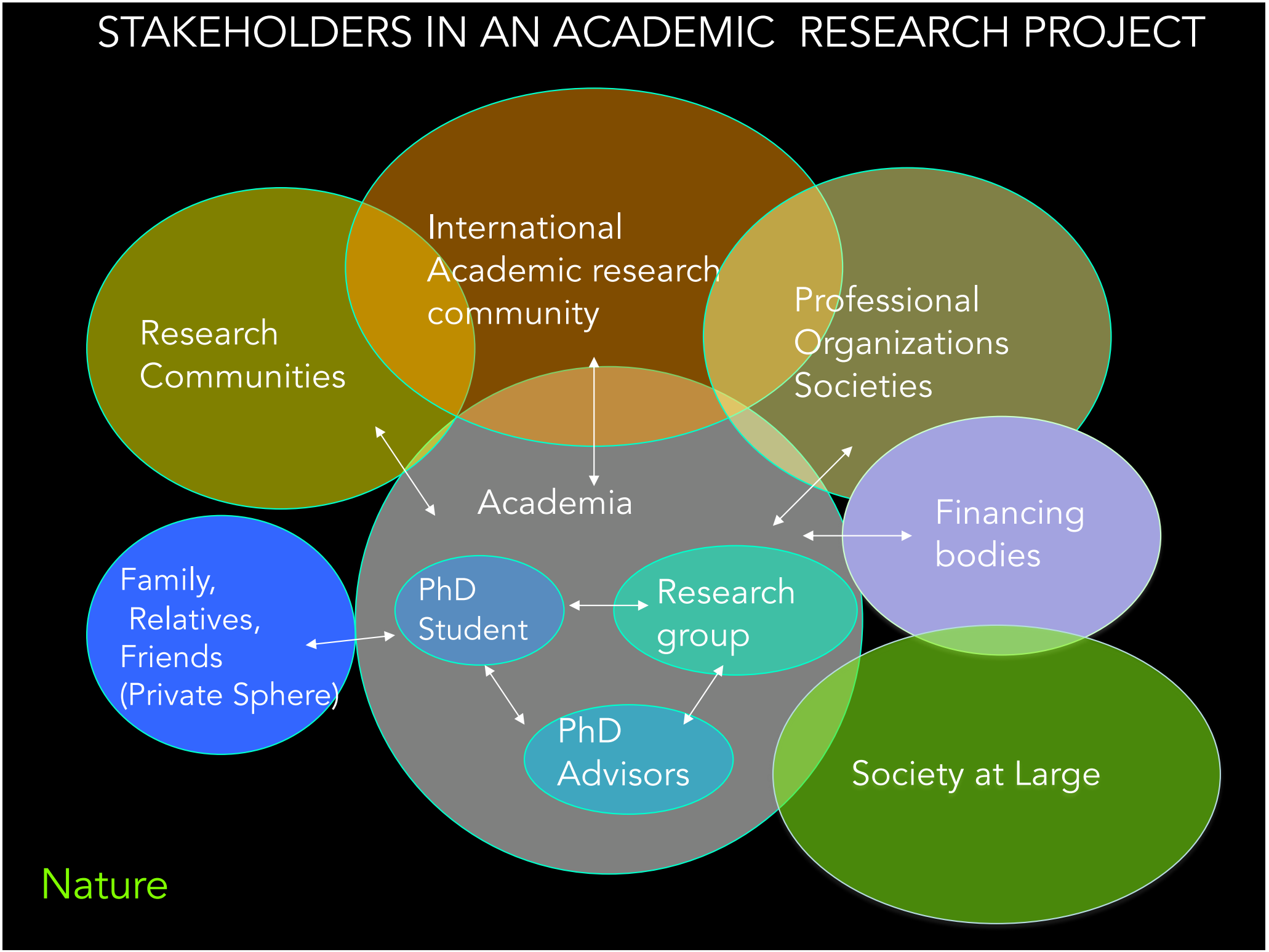




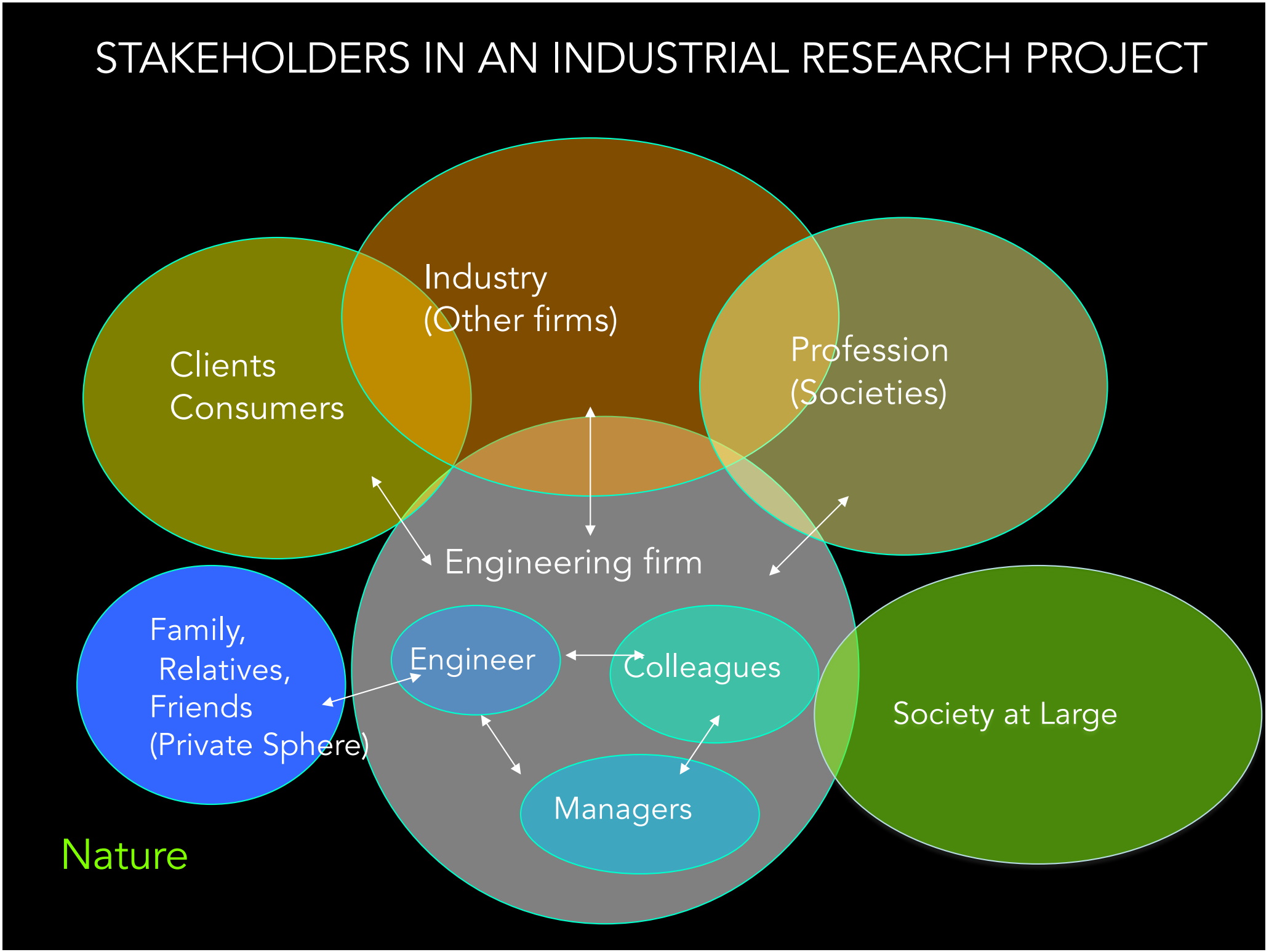
What if we could see in any wavelength of the electromagnetic spectrum, from gamma-rays to radio waves? How would the world appear to us?

ETHICS AND HUMAN RELATIONS – THE ROLE OF STAKEHOLDERS

STAKEHOLDERS IN AN ACADEMIC RESEARCH PROJECT



STAKEHOLDERS IN AN INDUSTRIAL RESEARCH PROJECT



ETHICS AND SOCIETAL ISSUES OF RESEARCH

Ethical Sensitivity

Why must scientists become more ethically sensitive than they used to be? **John Ziman** 1998

"Academic science" vs. "Industrial science"

Academic science is basically individualistic, following Merton defined four norms (1942) in "A Note on Science and Technology in a Democratic Order."

"The only constraint—an immensely powerful one in practice—was that the results of their research would be closely scrutinized by other members of one of the innumerable specialized research communities that partition the scientific world." [PEER REVIEW]

Merton norms for "Academic Science"

Universalism: scientific validity is independent of the sociopolitical status/personal attributes of its participants[3]

Communality - Cooperation/Openness/Sharing: all scientists should have common ownership of scientific goods (intellectual property), to promote collective collaboration; secrecy is the opposite of this norm.[4]

Disinterestedness: scientific institutions act for the benefit of a common scientific enterprise, rather than for the personal gain of individuals within them

Organized skepticism: scientific claims should be exposed to critical scrutiny before being accepted: both in methodology and institutional codes of conduct.

History: Science wars: "hard sciences" vs. "soft sciences"

"Industrial Science"

"Industrial scientists do not, in general, "own" their research in the sense of undertaking projects of their own choosing and being free to publish their results entirely on their own initiative."

"The personal values and needs of customers, patients, and other users have to be taken into account."

"The trouble is that industrial scientists do not actually have a direct say in how these dilemmas are solved."

IS THAT CORRECT? WHAT ARE WE DOING ABOUT IT?

Whistle-blowing as a possibility

Mode 1 and Mode 2 Research

Mode 2, post-academic, research is usually undertaken as a succession of "projects," each justified in advance to a funding body whose members are usually not scientists.

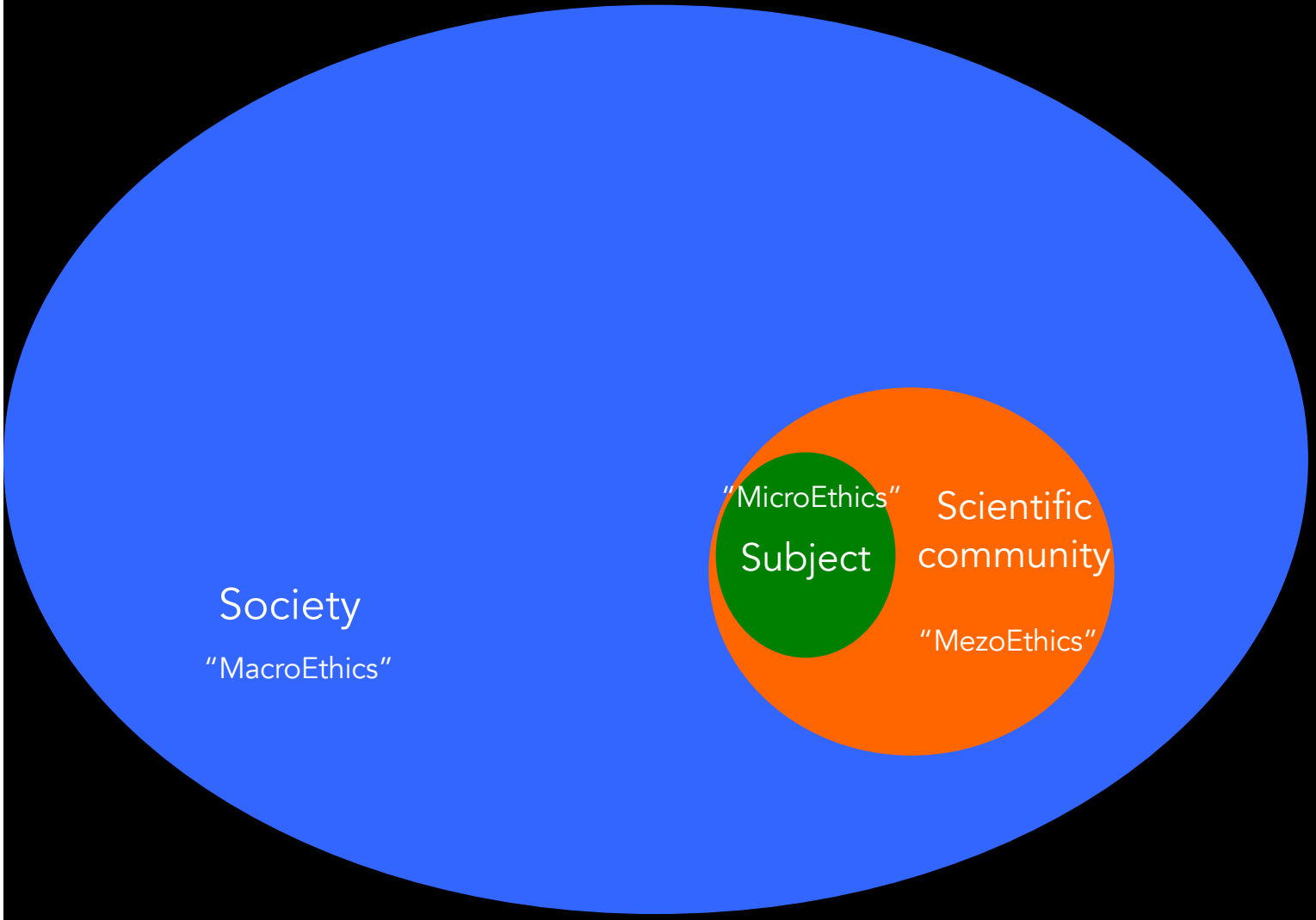
Important feature of post-academic science is that it is largely the work of teams of scientists, often networked over a number of different institutions. Where, then, do the ethical responsibilities lie?

OPEN QUESTION: HOW DO WE INVOLVE ALL IMPORTANT STAKEHOLDERS AND HOW TO NEGOTIATE COMMON SOLUTIONS? (THINKING IN TERMS OF COMPLEX SOCIO-TECHNOLOGICAL NETWORKS)

The State of The Art in Today's Research and Society

Peer Review, by AJC1, Flickr.com

Domains of Research Ethics



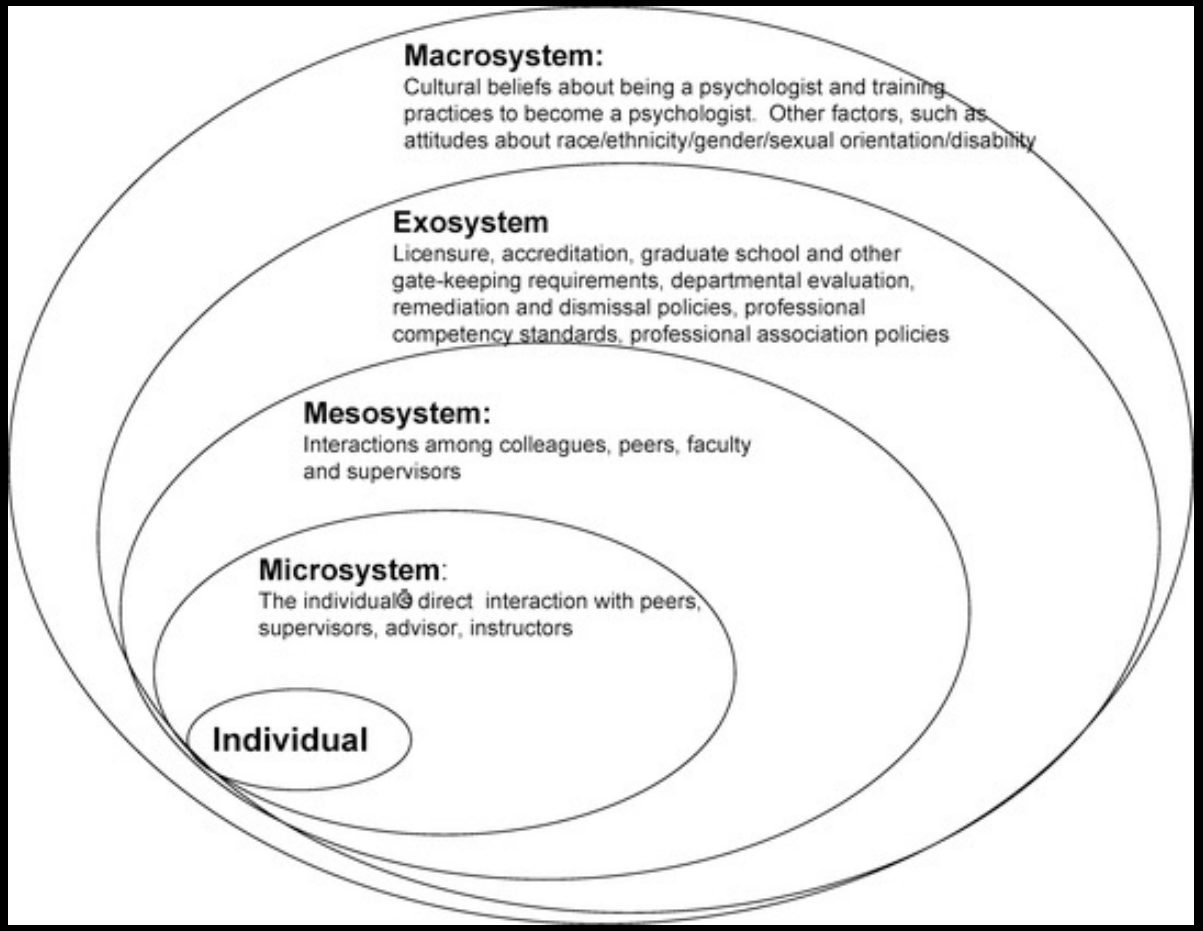
Is it true?
1. Scientific integrity

Is it fair?
2. Collegiality
3. Protection of human subjects
4.Animal welfare
5. Institutional integrity

Is it wise?
6. Social responsibility

Kenneth D. Pimple (2002) "Six Domains of Research Ethics. A Heuristic Framework for the Responsible Conduct of Research". Science and Engineering Ethics 8 , 191-205

Micro – Meso – Exo – Macro Domains



You will recognize this domain-based view in the analysis of many different types of problems – organization of society, sustainability of cities, ecology, economics, ethical aspects etc.

Source: American Psychological Association website

Research Ethics, REACTIVE WAY

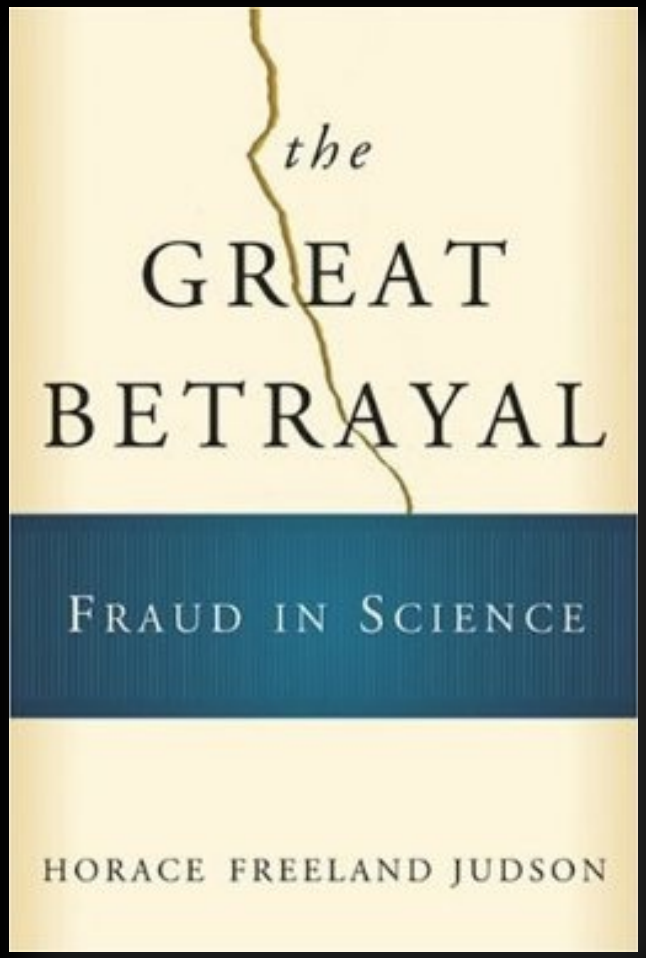
REACTIVE RESEARCH ETHICS
Learning Through Scandals

- In the 70s, *William Summerlin* claimed that he could transplant tissue between different animals but no one else could repeat the experiment. As an evidence he brought a bunch of white mice with black spots, to show that he could transplant tissue from black mice to white mice. However, after the presentation a technician discovered that the spots were painted with a black pen. To make up your data, is now called to "paint mice", to celebrate Summerlin's creativity.

- In the 80s, *Robert Slutsky* went in to *hyper production* mode publishing one paper every 10 days. The secret was to take one paper, just change the title, and send it off to a different journal.

- *Vijay Soman* was asked to review a paper that was written by Helena Rodbard. He turned the paper down, put his own name on the paper, and sent it off to another journal. Unfortunately, the paper was reviewed by Helena Rodbard…

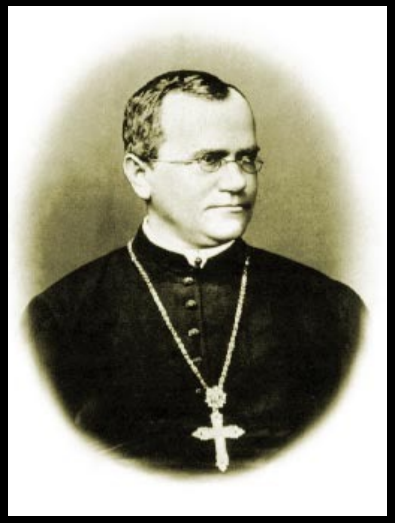
Famous "Sinners" in Science



Newton

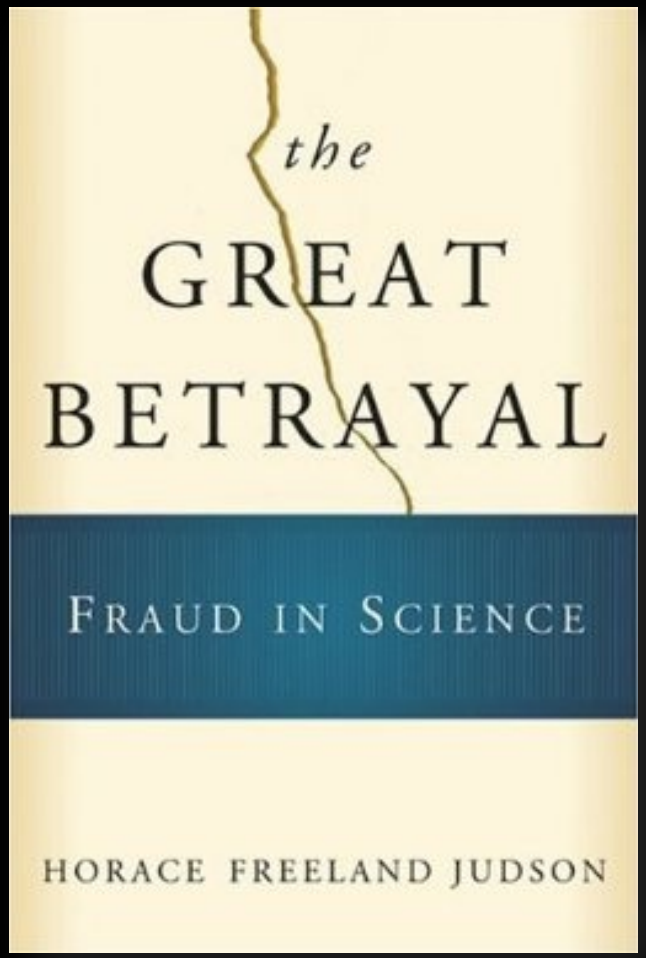
Kepler

Millikan



Mendel

Misconduct as FFP



Fabrication

Falsification

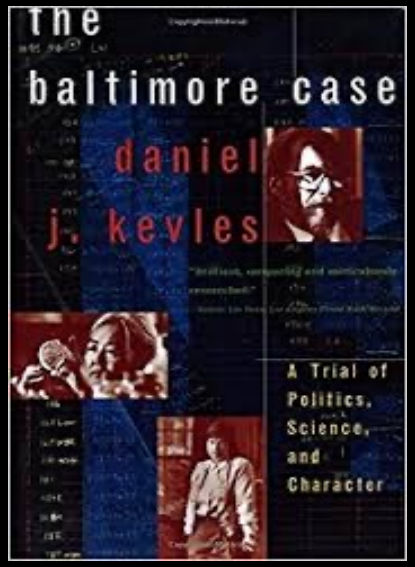
Threat to Reliability

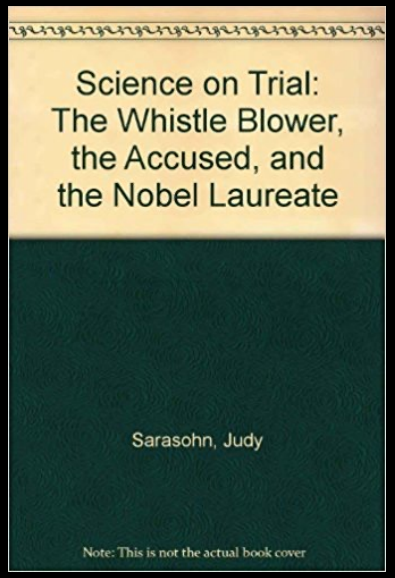
Plagiarism

Armstrong, J.D. (1993)

Lack of Justice

The The “Baltimore case”- The Baltimore scandal -





David Baltimore, best known to the public not for his Nobel prize but for his defense of a research collaborator who was accused of misconduct but officially exonerated after a decade of government inquiries.

The Baltimore Case (W. W. Norton, 1998) by Daniel J. Kevles

Science on trial: the whistle blower, the accused, and the Nobel laureate (New York : St. Martin's Press, 1993) by Judy Sarasohn

A recent tragic offer of a scandal of research misconduct in stem cell research

http://america.aljazeera.com/articles/2014/8/5/japan-stem-suicide.html
Yoshiki Sasai, 52, was the co-author of the high-profile research that had seemed to offer hope for replacing damaged cells or even growing new human organs. , 2014 08 05

"As deputy director of the RIKEN Center for Developmental Biology, Sasai supervised the work of lead author Haruko Obokata. The work took the world of of molecular *biology* by storm when it was published in the British journal Nature in January."

"Last week, Japan's prestigious Riken institute said the 30-year-old Dr. Obokata's research at Riken, which had seemed to offer a groundbreaking way of making stem cells easily, contained basic errors and wasn't backed up by laboratory notes. Dr. Obokata rejected the conclusion, saying the errors were made without ill intent, and said she planned to appeal the findings."

http://blogs.wsj.com/japanrealtime/2014/04/07/japan-stem-cell-researcher-obokata-is-hospitalized/

"Sasai's team retracted the research papers from British science journal Nature over Obokata's alleged malpractice, which she has contested. Retractions of papers in major scientific journals are extremely rare."

Research Ethics, PROACTIVE WAY
Creating shared values and culture

PROACTIVE RESEARCH ETHICS
Anticipation & Learning

- Ethics of different research fields – what research fields are addressing and how they are doing that – Information Ethics, Computing ethics, Bioethics, Medical ethics

- Ethics of researchers – codes of conduct – virtues and utility
  http://ec.europa.eu/research/participants/data/ref/fp7/89888/ethics-for-researchers_en.pdf

- Study of research ethics itself – can cognitive science help us understand ethics better?
  http://www.iep.utm.edu/m-cog-sc/

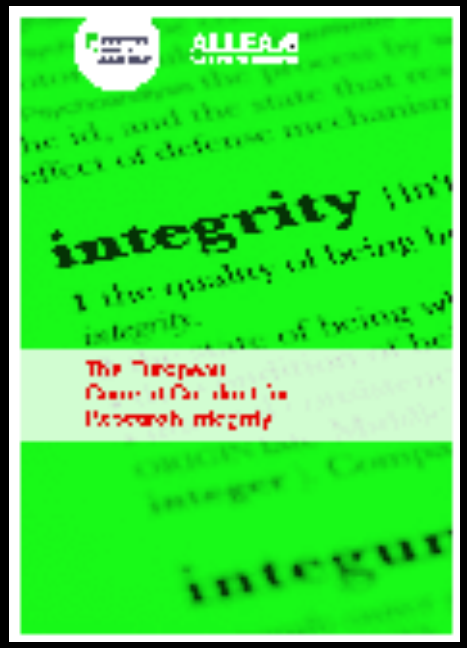
- Can Ethics be defended by unethical means?

IMPORTANCE OF RESEARCH ETHICS

- Research ethics is not merely a concern for the individual participants (rules of conduct), but of the **research communities**, globally.
- Research ethics is a concern for the **profession** as a whole.
- Research ethics is a subset of professional ethics.
- Research ethics affects society at large.

CULTURE VS. STRATEGY

ESF PUBLICATIONS



- The European Science Foundations Code of Conduct for Research Integrity http://www.esf.org/
- European Peer Review Guide – Integrating Policies and Practices into Coherent Procedures
- Fostering Research Integrity in Europe http://www.oeawi.at/downloads/ESF-research-integrity-report.pdf
- http://www.oeawi.at/en/links.asp

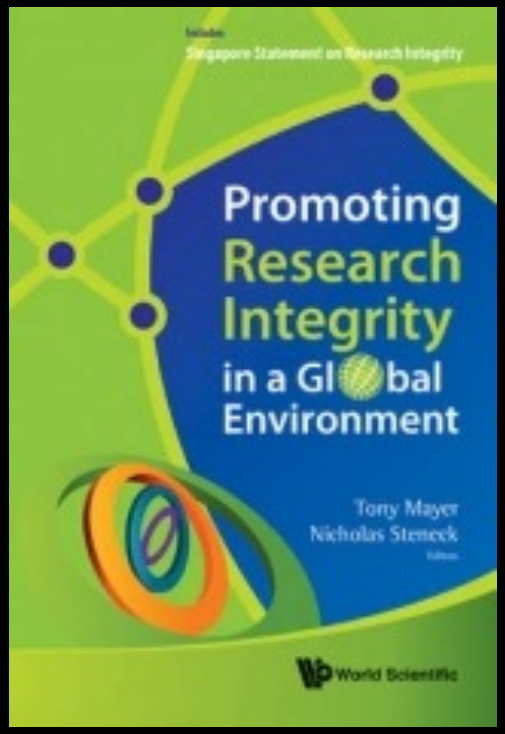
ON BEING A SCIENTIST

ON BEING A SCIENTIST
A GUIDE TO RESPONSIBLE CONDUCT IN RESEARCH

Committee on Science, Engineering, and Public Policy
NATIONAL ACADEMY OF SCIENCES, NATIONAL ACADEMY OF ENGINEERING, AND INSTITUTE OF MEDICINE OF THE NATIONAL ACADEMIES
THE NATIONAL ACADEMIES PRESS
Washington, D.C.

http://www.nap.edu/catalog.php?record_id=12192

PROMOTING RESEARCH INTEGRITY IN A GLOBAL ENVIRONMENT



http://www.worldscientific.com/worldscibooks/10.1142/8102
Promoting Research Integrity in a Global Environment

Sample Chapters

Introduction

http://www.worldscientific.com/doi/suppl/10.1142/8102/suppl_file/8102_intro.pdf

Section II: Research Integrity Structures

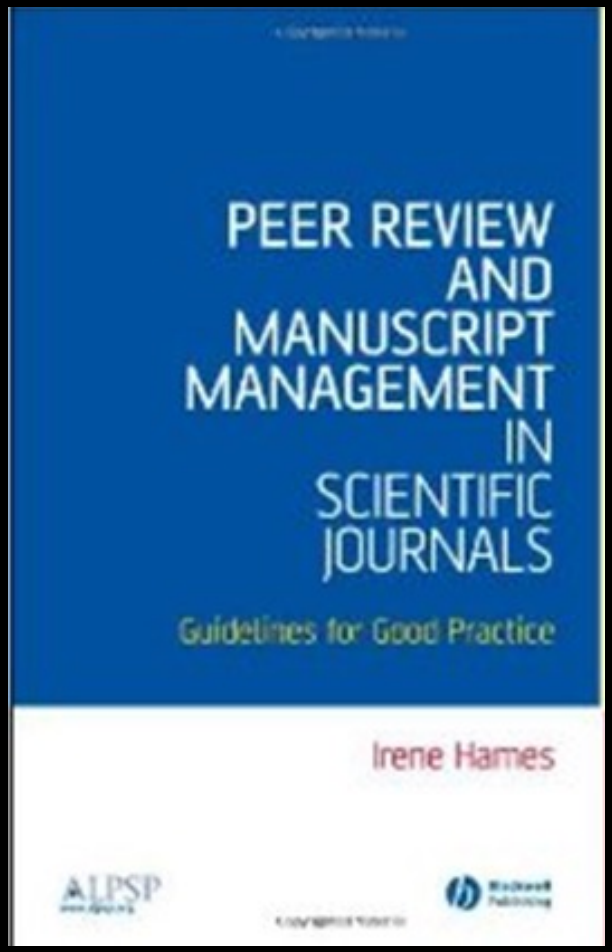
http://www.beck-shop.de/fachbuch/leseprobe/9789814340977_Excerpt_001.pdf

Section III: Research Misconduct

http://www.worldscientific.com/doi/suppl/10.1142/8102/suppl_file/8102_chap14.pdf

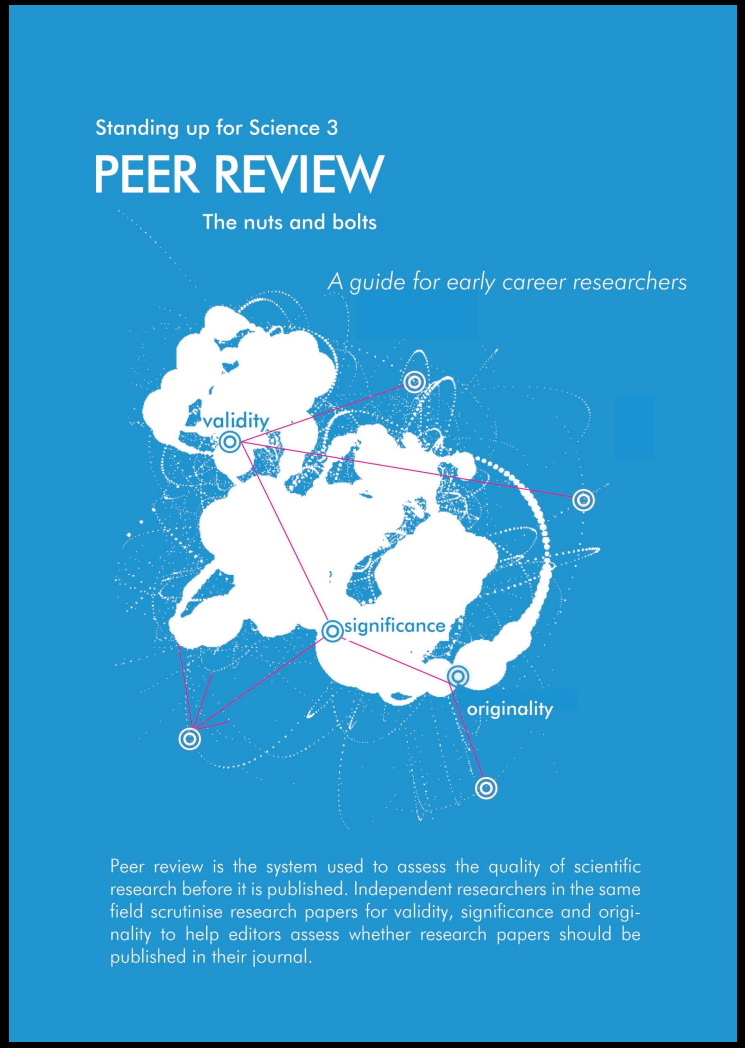
http://books.google.de/books?id=q3TZu6sovJMC&printsec=frontcover&hl=de&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
Promoting Research Integrity in a Global Environment

PEER REVIEW AND MANUSCRIPT MANAGEMENT



http://books.google.se/books?id=cz3KZ--RajQC&printsec=frontcover&dq=peer+review+and+manuscript&hl=en&sa=X&ei=bfz4UsiLCM3bsgbwrIDgAg&ved=0CCwQ6AEwAA#v=onepage&q=peer%20review%20and%20manuscript&f=false

PEER REVIEW – NUTS AND BOLTS



http://www.senseaboutscience.org/data/files/resources/99/Peer-review_The-nuts-and-bolts.pdf

World Conferences on Research Integrity

https://wcrif.org/

https://wcri2022.org/

- 7th World Conference on Research Integrity, Cape Town, South Africa 2022
- 6th World Conference on Research Integrity in Hong Kong 2018
- 5th World Conference on Research Integrity in Amsterdam 2017
- 4th World Conference on Research Integrity in Rio de Janeiro 2015
- 3rd World Conference on Research Integrity Montreal 2013
- 2nd World Conference on Research Integrity Singapore 2010
- 1th World Conference on Research Integrity in Lisbon 2007

Ethics in Research, Social Aspects

PROACTIVE WAY

Educating Engineers for the Future

We are educating engineers for solving **future problems.**

Digitalization is going to radically change our technology and society.

Choices are made all the time in design and engineering and sensitivity to **values** is needed

Ethics should be **proactive** (learning, anticipating) instead of **reactive** (punishing and prosecuting "ethics of scandals and affairs") activated only when something goes wrong.

T-SHAPED ENGINEERS (Barry Boehm)

"With respect to system thinking, a T-shaped person is one who has technical depth in at least one aspect of the system's content, and a workable level of understanding of a fair number of the other system aspects. Many pure computer science graduates are strongly I-shaped, with a great deal of depth in software technology, but little understanding of the other disciplines involved in such areas as business, medicine, transportation, or Internet of Things. This leaves them poorly prepared to participate in the increasing numbers of projects involving multi-discipline system thinking." Boehm and KoolManojwong Mobasser

Research and Innovation are supporting research process and products of research that will contribute to the advancement of humanity and avert catastrophic events or in the worst case mitigate their consequences. They necessitate education of engineers with developed sensitivity to social aspects of engineering, including courses on research and engineering ethics and sustainable development.

Engineering as Social Experimentation

“ All products of technology present some potential dangers, and thus engineering is an inherently risky activity. In order to underscore this fact and help in exploring its ethical implications, we suggest that engineering should be viewed as an experimental process. It is not, of course, an experiment conducted solely in a laboratory under controlled conditions. Rather, it is an experiment on a social scale involving human subjects.”

Ethics in Engineering, Martin, M.W., Schinzinger, McGraw-Hill, NY, 2005.

Professional Codes of Ethics: The Goal

- Acquiring skill in practical ethical reasoning in a professional domain
- Developing the ethical autonomy, i.e. the ability and the habit to think rationally and critically about the ethical questions.

Professional Codes of Ethics: The Role

- Importance of professional knowledge and role-specific professional obligations in resolving professional ethical conflicts
- General principles necessary to comprehend and apply professional codes of ethics
- Case based reasoning with applying and interpreting codes

Reactive vs. Proactive or Compliance vs. Beyond Compliance

- A proactive approach is more effective as it relies on understanding than reactive policies which rely on fear of punishment. What is more, proactive policies are based on respect for humans.
- Important to avoid "witch hunt" and abuse of allegations of misconduct as a method to eliminate competitors. Well motivated established practices and rules are necessary and respect for the personal integrity of a researcher.
- Finally, not to forget: Who guards the guardians?/ Who watches the watchmen? Most suitably, the research community that sets the standards of responsible conduct within a given research field should also influence the bodies that issue rules and policies.
- Unethical behaviour in the name of ethics can never be justified.

Stacey, A and Stacey, J.

Integrating Sustainable Development into Research Ethics Protocols

The Electronic Journal of Business Research Methods Volume 10 Issue 2 2012 (pp 54-63),

available online at www.ejbrm.com

FIVE CAPITALS (VALUES)	
NATURAL	Natural world. Landscapes, ecologies, animals, plants and other life. Raw materials. Any stock or flow of energy and matter that yields valuable goods and services
HUMAN	Health, knowledge, skills and motivation, Intellectual, cultural, cognitive & emotional (well-being, happiness)
SOCIAL	Structures, institutions, networks and relationships which enable individuals to maintain and develop their human capital in partnership with others. Organized in circles of proximity, cognitively sustainable.
PRODUCTION	Production means of material culture - Material goods – tools, machines, buildings and other forms of infrastructure – which contribute to the production process but do not become embodied in output.
FINANCIAL	Monetary capital and relationships

TAXONOMY OF RISKS

Categorisation of risk type	Definition	Probability typically	Researchers' obligations
Unaddressed	Consequences are known to the researchers but are not examined because of the predefined scope of the research.	High	Public disclosure and engagement with stakeholders to achieve consensus on research scope and objectives.
Unintended	Consequences are known to the researchers, but with low enough probabilities that associated risks can be ignored.	Low	Include in the scope of the research measures to avoid negative consequences, despite the low probability.
Unexpected	Consequences are known to the researchers, but no anticipated risk because of assumed zero probability of occurrence.	Zero	Disclosure and consultation within the professional and academic community to corroborate zero probability of occurrence.
Unforeseen	Consequences are unknown to the researchers, but could reasonably have been foreseen if researchers had anticipated risk.	Unknown	Anticipate possible negative consequences, and their associated probabilities and impacts.
Unforeseeable	Consequences could not have been reasonably identified by researchers at the given moment.	Undefined	Remain open-minded to possible negative consequences, and seek input on these, no matter which stakeholder(s) recognize(s) the risks.

CODES OF ETHICS

IEEE Code of Ethics

1. Accept responsibility in making engineering decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
2. Avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. Be honest and realistic in stating claims or estimates based on available data;
4. Reject bribery in all its forms;

IEEE Code of Ethics

5. Improve the understanding of technology, its appropriate application, and potential consequences;
6. Maintain and improve our technical competence and undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
7. Seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;

IEEE Code of Ethics

8. Treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;
9. Avoid injuring others, their property, reputation, or employment by false or malicious action;
10. Assist colleagues and co-workers in their professional development and support them in following this code of ethics.

https://www.ieee.org/about/corporate/governance/p7-8.html

ACM (Association of Computer Machinery) Code of Conduct

1. General Moral Imperatives

1.1 Contribute to society and human well-being

1.2 Avoid harm to others

1.3 Be honest and trustworthy

1.4 Be fair and take action not to discriminate

1.5 Honor property rights including copyrights and patents

1.6 Give proper credit for intellectual property

1.7 Respect the privacy of others

1.8 Honor confidentiality

http://onlineethics.org/codes/ACMcode.html


ethics
Metaethics
problems
made
good
study
time
find
right
independent
Along
coerce
principles
approached
sub-branches
perspectives
employ
come
applies
tell
political
life
deciding
always
opinions
judge
attempt
promote
principle
single
call
rights
term
place
guide
attempting
particular
coincide
province
otherwise
note
need
saying
typically
metaethical
contemporary

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Owen, R., Macnaghten, P.M., Stilgoe, J. 2012. **Responsible Research and Innovation: from Science in Society to Science for Society, with Society**. Science and Public Policy 39 (6): 751/760.

http://www.idt.mdh.se/kurser/cd5590 **Professional Ethics Course**

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