2-1-2010

Annotated Bibliography of Ethical Issues in Physics: Physics and Society Issues

Marshall Thomsen
Eastern Michigan University, jthomsen@emich.edu

Follow this and additional works at: https://scholarworks.umass.edu/esence

Part of the Physics Commons

Recommended Citation
Retrieved from https://scholarworks.umass.edu/esence/390

This Working Paper is brought to you for free and open access by the Science, Technology and Society Initiative at ScholarWorks@UMass Amherst. It has been accepted for inclusion in Ethics in Science and Engineering National Clearinghouse by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.
SOC
Science and Engineering Ethics
Volume 17, Number 4 / December 2011, pp. 723-737
Negotiating Plausibility: Intervening in the Future of Nanotechnology
Cynthia Selin
The author discusses how one can examine the potential societal impact of emergent technologies, using nanotechnology as a case study.

Science and Engineering Ethics
Volume 17, Number 4 / December 2011, pp. 739-742
On Identifying Plausibility and Deliberative Public Policy
Commentary on: “Negotiating Plausibility: Intervening in the Future of Nanotechnology”
René Von Schomberg
In this commentary the author points out that the procedure described in the preceding paper produces not only a more transparent process for evaluating emergent technologies but will also likely produce higher quality decisions.
Adding to the Mix: Integrating ELSI into a National Nanoscale Science and Technology Center
David J. Bjornstad and Amy K. Wolfe
The authors discuss a mechanism for integrating Ethical, Legal and Social Issues research into nanomaterials research, arguing that it benefits both the materials research program and society at large.

Nanoethics and the Breaching of Boundaries: A Heuristic for Going from Encouragement to a Fuller Integration of Ethical, Legal and Social Issues and Science
Commentary on: “Adding to the Mix: Integrating ELSI into a National Nanoscale Science and Technology Center”
Julio R. Tuma
The author points out that ELSI research should include an investigation of “boundary crossings” related to far reaching effects of technology associated with the tendency for some new technologies to breach existing boundaries, and to have unpredictable effects that are persistent.

Scientific Research and the Public Trust
David B. Resnik
The author argues that the concept of “the public trust” needs to be refined since the public is not a monolithic entity.
Honesty, Perseverance, and Objectivity: Lessons from a Life in Public Policy
John F. Ahearne
The author draws on examples ranging from accidents in nuclear power plants to his experience with national security issues.

Nononsense On Stilts: How to Tell Science from Bunk
Massimo Pigliucci (reviewed by Lawrence S. Lerner)
Book Review

Patenting and Licensing of University Research: Promoting Innovation or Undermining Academic Values?
Sigrid Sterckx
The author describes the rise in university owned patents and some of the negative consequences of the push for more such patents. Four proposals are made to reduce the negative impact of university owned patents.

On Fact and Fraud - Cautionary Tales from the Front Lines of Science
David Goodstein (reviewed by Joe Levinger)
Book Review
Am I Making Myself Clear?: A Scientist’s Guide to Talking to the Public
Cornelia Dean (reviewed by Peter Schroeder
Book Review

Don’t Be Such a Scientist: Talking Substance In an Age of Style
Randy Olson (reviewed by Leonard R. Solon
Book Review

Science Committee Hearing Spotlights Shortage in Critical Isotope
A discussion of the implications of dwindling supplies of He-3.

The security implications of nanotechnology
Margaret Kosal
The author argues that even though the potential for nanotechnology-based chemical and biological weapons is speculative, we nevertheless need to monitor nanotechnology carefully for internationally security reasons.

Communicating Science to the Media
Kathryn Grim
The author provides a tutorial on preparing for an interview with a reporter, addressing several issues related to effective communication between scientists and the public at large.
The growing threat of space debris
Samuel Black
The author discusses the origins of space debris, its significance, and mitigation efforts.

Why Science cannot be Value-Free
Understanding the Rationality and Responsibility of Science
Agnieszka Lekka-Kowalik
It is argued that scientists must consider the impact their research has or might have on society—these issues are not solely in the realm of the policy makers.

Global Warming: Lessons from Ozone Depletion
Art Hobson
This article provides a concise history of international efforts to control CFC release into the atmosphere and argues the cooperation among interested parties demonstrated in that effort is what is needed to combat greenhouse gases in the context of global climate change.
SOC
Physics Today -- December 2009
Volume 62, Issue 12, pp. 32-37
Lighting and astronomy
Christian B. Luginbuhl, Constance E. Walker, and Richard J. Wainscoat
This article discusses modeling of light pollution and what can be done to reduce its impact.

Physics Today—June 2010
Volume 63, Issue 6, pp. 8-10
Many facets of light pollution
Mark S. Rea, John D. Bullough, Jennifer A. Brons, Christian B. Luginbuhl, Constance E. Walker, and Richard J. Wainscoat

SOC
Physics Today -- December 2009
Volume 62, Issue 12, pp. 28-30
Congressional fellows tackle a range of national issues
Jermey N. A. Matthews
Physics Today reports annually on this program to send physicists and engineers to work with Congress on technical issues.

SOC
Physics Today -- November 2009
Volume 62, Issue 11, pp. 39-44
Human-generated sound and marine mammals
Peter L. Tyack
This article describes research into sound sources (such as noise from commercial ships), how these sounds are perceived by marine mammals, and what impact they have on these mammals.
US government agencies work to minimize damage due to helium-3 shortfall
Toni Feder
Increased demand for helium-3 for applications such as plutonium detectors in use at U. S. borders is making it more challenging to allocate this resource.

As weapons work slows, DOE labs keep busy with research
David Kramer
A news article discussing the current mission at national labs that have historically focused on weapons research.

The author reviews polling data about public reaction to energy related issues to gain insight into what needs to be done in order that science effectively informs policy. He proposes research that is guided towards addressing critical problems but that is evaluated on its quality.
SOC
APS Forum on Physics and Society Newsletter
Volume 38, Number 4 October 2009
The Medical Isotope Shortage
Thomas J. Ruth
Reactor shut downs resulting in shortages of medical isotopes have served as a warning that the isotope supply issue needs to be addressed.

APS Forum on Physics and Society Newsletter
Volume 39, Number 2 April 2010
Isotopes for the Nation’s Future
Donald F. Geesaman and Ani Aprahamian
The authors provide a brief overview of the Isotope Program at the Department of Energy.
SOC
APS Forum on Physics and Society Newsletter
Volume 38, Number 4 October 2009
Physics for Future Presidents: The Science Behind the Headlines
By Richard A. Muller
Reviewed by Ruth Howe
Book Review

BEGIN LINK

SOC
Science and Engineering Ethics
Volume 15, Number 3 / September, 2009, pp. 375-394
The Problems with Forbidding Science
Gary E. Marchant and Lynda L. Pope
The authors argue that restrictions on scientific research are best imposed by scientists themselves: they have a demonstrable interest in maintaining the public trust and they can respond more quickly and effectively to evolving fields of inquiry.

Science and Engineering Ethics
Volume 15, Number 3 / September, 2009, pp. 395-406
Scientific Self-Regulation—So Good, How Can it Fail?
Commentary on “The Problems with Forbidding Science”
Patrick L. Taylor
This commentary on the preceding paper contrasts successful self-regulation of stem cell research to less than successful self regulation in issues related to conflict of interest.

END LINK
This article looks at the definition of “rights” and explores political and legal aspects of the right to research. It notes that society can restrict research in a given area not only by banning it, but also by merely denying support for it.

In his commentary on the above paper, this author points out that scientists must also deal with corporate influences on the direction of research.

An overview of a conference and of this special issue of SEE on the topic of whether certain areas of scientific research should be forbidden.

The author argues that it is important to maintain the quality of information on the web that is being presented as “scientific,” and that there should be an appropriate reward system for scientists working in this area.
Nanomaterial safety
Scott E. McNeil
The author discusses research on the possible link between nanoparticles and cancer, paying particular attention to a study involving gold nanoparticles and lab rats that indicates the cancer risk may be highly dependent on the type of coating on the particle.

BEGIN LINK

SOC
Physics Today -- January 2009
Volume 62, Issue 1, pp. 41-47
Panofsky agonistes: The 1950 loyalty oath at Berkeley
Personal correspondence gives insight into Panofsky’s reaction when confronted with the University of California loyalty oath shortly after World War II.

Physics Today -- June 2009
Volume 62, Issue 6, pp. 8-10
Berkeley loyalty oath tested politics, fear—not loyalty
Kenneth W. Ford, Howard D. Greyber, Robert P. Crease, and J. D. Jackson

END LINK
The larger world of nano
Cyrus C. M. Mody
There is a mismatch between public and nanoscientist perception of risk in nanotechnology, and the author argues the gap can be closed with help from those in social science and humanities.

Parallel issues in nanotech, climate science
Wolfgang Knorr

NSF–EPA centers study safety of nanomaterials
Toni Feder

The Essential Exponential! For the Future of Our Planet
By Albert A. Bartlett with Robert G. Fuller, Vicki L. Plano Clark, and John A. Rogers
Reviewed by Manish Gupta
Book Review

Legal Battle Over Sonar Testing Heats Up
Jennifer Ouellette
A history of the several year legal battle over whether sonar testing harms marine mammals.
You Say You Want an Evolution? A Role for Scientists in Science Education

Coalition of Scientific Societies

This report on a survey of the attitude of Americans towards science provides useful background for a discussion of science and society issues.

BEGIN LINK

SOC
Physics Today -- December 2007
Volume 60, Issue 12, pp. 48-52
The Copernican Myths
Mano Singham
This article serves to remind us that the history we learn casually is not always well-researched.

Physics Today -- June 2008
Volume 61, Issue 6, pp. 8-12
Dispelling myths and highlighting history of the heliocentric model
Ljiljana Dobrosavljevic-Grujic, Leonid V. Azaroff, Robert N. Oerter, Michael Schaa, Frank R. Tangherlini, Paul Dickson, William Unruh, and Mano Singham

END LINK

SOC
Bulletin of the Atomic Scientists
63.6 (November-December 2007) pp. 40-47
An inconvenient assessment
Chris Mooney
This essay on a national assessment of climate change discusses the origins of the study as well as the fate of the report. It explores issues at the interface of science with politics.
Space Debris
David Wright
This overview of current level of space debris and implications for the future reminds us of this frequently overlooked environmental problem.

Carbon dioxide on the move
Richard Doctor
This brief article points out the safety hazards of working with large quantities of carbon dioxide.

Freedom of inquiry
Freeman Dyson
The author argues that forbidding certain types of scientific research is not an effective way of defending against misuse of advances in science.

The Pros and Cons of Leap Seconds
Brian Luzum
Not exactly headline material, but nevertheless this is a brief, easy to understand case study of how science impacts society in somewhat unexpected ways.
Physicist Andrew Maynard argues that more effort is needed to study potential risks of nanotechnology now that this has become a multi-billion dollar industry involving wide ranging products such as cosmetics and neck support pillows.

Jim Dawson

A brief look at government policy regarding communication by government-employed scientists.

Murray Peshkin

The author argues for the importance of giving talks to general audiences in which distinctions are drawn between science and religion.

Michael Matthews, David Morrison, Moorad Alexanian, Joe Heafner, Juan G. Roederer, Keith Schofield, and Michael Todhunter
This article provides an historical perspective on how science policy is formed in this country, including a discussion of the role physicists play in forming such policy.

Issues addressed in the planned studies include the ethical implications of having sensors so small they can be unobtrusively sprayed on people.

A short commentary on the fact that certain federal employees do not have whistleblower protection and hence may need to choose between their career and exposing wrongdoing.

Protect Whistleblowers (Letter)
Beth Daley

END LINK
Some interesting, basic physics is involved in this discussion of the use of straw bales for building walls.

The mechanics of automobile accidents are used to give insight into auto safety policy issues.
SOC
APS Forum on Physics and Society Newsletter
Volume 34, Number 4 October 2005
The Great Fallout-Cancer Story of 1978 and its Aftermath
Daniel W. Miles
A former resident of St. George Nevada questions repeated stories of excessive cancer rates in the town arising from nuclear testing, contrasting conclusions of books drawn from anecdotal evidence and preliminary reports with his investigation of a variety of other sources.

SOC
APS Forum on Physics and Society Newsletter
Volume 34, Number 3 July 2005
The American Physical Society’s Involvement in the Defense of Human Rights
Edward Gerjuoy
The APS Committee on International Freedom of Scientists works to protect the rights of all scientists, not just physicists.

SOC
Bulletin of the Atomic Scientists
61.3 (May-June 2005): pp. 60-61
The Pentagon’s psychic friends network
Review of “The Men Who Stare at Goats:
By Jon Ronson
Reviewed by Michael Shermer
Book Review

SOC
Science and Engineering Ethics
Volume 10, Number 2 / June, 2004, pp. 235-242
Eight-dimensional methodology for innovative thinking about the case and ethics of the mount graham, large binocular telescope project
Rosalyn W. Berne and Daniel Raviv
When construction of an observatory is planned for sacred Native American grounds, astronomers confront some issues they are not used to dealing with.
SOC
APS Forum on Physics and Society Newsletter
Volume 32, Number 4 October 2003
Risk and Reason: Safety Law and the Environment, by Cass Sunstein,
Reviewed by Peter Schroeder
Book Review

SOC
APS Forum on Physics and Society Newsletter
Volume 32, Number 3 July 2003
Letters from Italy: A Physicist's Decision not to Review Papers for Phys. Rev., Daniel Amit
This brief exchange between an editor and a “retiring” reviewer illustrates an interesting intersection between publication issues and international policy issues.

SOC
Physics Today -- February 2003
Volume 56, Issue 2, pp. 48-52
The Privilege of Being a Physicist
Victor F. Weisskopf
A reprint of the author’s 1969 Physics Today article in which he discusses the importance of the way in which physicists interact with society at large.

SOC
APS Forum on Physics and Society Newsletter
Volume 32, Number 1 January 2003
Sniffer Plane Secrets and Political Courage
Alan J. Scott
While this article straddles the fence between science/society issues and political analysis, it does serve to illustrate the importance of openness in scientific inquiry by examining a celebrated case of fraud in military research.
SOC
Bulletin of the Atomic Scientists
58.4 (July-August 2002): pp. 65-66
Science, Money, and Politics: Political Triumph and Ethical Erosion Daniel S. Greenberg
Reviewed by Michael S. Reidy
Book Review

BEGIN LINK

SOC
Physics Today -- June 2002
Volume 55, Issue 6, pp. 48-51
Intelligent Design Is Creationism in a Cheap Tuxedo
Adrian L. Melott
and pp. 48-51
Philosophy Is Essential to the Intelligent Design Debate
Mano Singham
Two essays that open up issues on the nature of science and on the interactions between scientists and society at large.

Physics Today -- September 2002
Volume 55, Issue 9, pp. 10-82
Seven More Views on Intelligent Design
Ralph Linsker, Pantazis Mouroulis, Moorad Alexanian, Mano Singham, Claud E. Lacy, James C. Adamski, Adrian L. Melott, Megan Donahue, and George L. Murphy

Physics Today -- November 2002
Volume 55, Issue 11, pp. 95-97
Intelligent Design Tangles Science and Religion
David C. Nobes, Jim A. Van Vechten, Ted Lawry, Adrian Melott, and Mano Singham

END LINK
BEGIN LINK

SOC
APS Forum on Physics and Society Newsletter
Volume 31, Number 2 April 2002
Humanitarian De-mining and the Quest for Better Ways to Locate Buried Non-metallic Objects
Surajit Sen and Ronald L. Woodfin
The author reviews recent advances in technology to locate land mines, noting that more research is needed to develop safe and effective de-mining equipment.

APS Forum on Physics and Society Newsletter
Volume 31, Number 3 July 2002
Mine Detection and the Need for New Technology
Patrick Blagden
Not written in response to the above article but covers the same general topic from a different perspective, so it makes a good companion piece.

END LINK

SOC
Science and Engineering Ethics
Volume 8, Number 1 / March, 2002, pp. 59-81
Representation and misrepresentation: Tufte and the Morton Thiokol engineers on the Challenger
Wade Robison
This discussion of events that preceded the Challenger accident illustrates the challenges that scientists and engineers can have when interacting with managers and reminds us that sometimes these interactions have life and death consequences.

SOC
Science and Engineering Ethics
Volume 8, Number 1 / March, 2002, pp. 43-57
Ethics and science: Educating the public
R. Brownhill and L. Merricks
Looks at a debate over fundamental ethical issues in science that took place in the first half of the twentieth century, including issues such as to what extent are scientists responsible for how their research is used.

Copyright 2012 Marshall Thomsen
Science, Money, and Politics: Political Triumph and Ethical Erosion
Daniel S. Greenberg and Norman Metzger, Reviewer
Book Review

The authors analyze crash statistics to make the case that one cannot assume that reducing vehicle weight will increase the fatality rate associated with automobile accidents.

SOC
APS Forum on Physics and Society Newsletter
Volume 31, Number 1 January 2002
Losing Weight to Save Lives: A Review of the Role of Automobile Weight and Size in Traffic Fatalities
Marc Ross and Tom Wenzel

END LINK
Beyond the Science Wars: The Missing Discourse about Science and Society and Real Science: What It Is, and What It Means
Ullica Segerstråle, John Ziman, Craig McConnell, Reviewer, and Robert H. March, Reviewer
Book Review

When Did the Science Wars Start?
Theo Theocharis and Mihalis Psimopoulos

Reflections on ‘Real science: What it is, and what it means’ by John Ziman
Raymond Spier

A response to reflections on ‘Real Science: What it is and what it means’
John Ziman

What is the Imperative for Basic Science that Serves National Needs?
Gerald Holton
The author argues that the most important component of the moral authority of science is its obligation to the larger community. Science in this country needs to do more for society and needs the resources to do more.
SOC
Science and Engineering Ethics
Volume 6, Number 4 / December, 2000, pp. 549-552
Why scientists should cooperate with journalists
Boyce Rensberger
The author argues that there is a general interest in science among the
general population, but there is often an inability to distinguish between
science and pseudoscience.

SOC
Science and Engineering Ethics
Volume 6, Number 4 / December, 2000, pp. 435-442
Ethical issues in communicating science
Jinnie M. Garreau and Stephanie J. Bird
Lays out a framework for discussion of issues related to communication
within the scientific community as well as between scientists and society at
large.

SOC
Science and Engineering Ethics
Volume 6, Number 3 / September, 2000, pp. 341-349
Moral responsibility and the ‘ignorant scientist’
John Forge
A discussion of the extent to which scientists engaged in “pure” research can
be held morally accountable for unforeseen outcomes of their work.
Teaching and Propaganda
Mano Singham
The author argues that there is an element of brainwashing that goes on when we teach, and this raises interesting issues when some students question the Big Bang theory.

Teaching, Propaganda, and the Middle Ground
W. C. Morrey, Hoi-Kwong Lo, Pantazis Mouroulis, Charles K. Scharnberger, Gary Powell, Philip E. Kaldon, Phil Baringer, Moorad Alexanian, and Mano Singham

What Happened to Science Education: Kansas and Beyond
Adrian L. Melott
The debate over evolution impacts physics teachers’ ability to discuss things like the Big Bang theory and strikes at the very heart of how we define science and how the public perceives science.

Why People Believe Wierd Things: Pseudoscience, Superstition and other Confusions of Our Time by Michael Shermer:
Reviewed by Mark E. Borrello
Book Review
Experts Dismiss Doomsday Scenarios for RHIC
The possibility that a high energy physics experiment could inadvertently produce a black hole that would swallow the earth was considered in the context of the Relativistic Heavy Ion Collider at Brookhaven.

Radiation Risk and Ethics
Zbigniew Jaworowski
This article and the subsequent letters illustrate debate among physicists over issues of immediate societal importance.

Radiation Risks and LNT: The Discussion Continues
Richard Wilson, Richard L. Garwin, and Zbigniew Jaworowski

Low Dose Rates Need Consideration in LNT?
Frank Ellis