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Teaching Citizenship Through Scientific Debates: A Philosophical Approach

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Science is an integral part of modern everyday life. This puts the citizen on center stage as more and more critical decisions and policies that modern democratic governments advance increasingly depend and are influenced by science and its products-be it stem cell research, health care or global warming. By focusing on specially chosen case studies, this session aims at demonstrating how explicitly integrating philosophical methods and concepts into some of the historical as well as contemporary milestone scientific debates can be used to model, and perhaps even strengthen, citizenship characteristics. Furthermore, without minimizing the differences, the session will highlight some of the important similarities that are characteristic of paradigmatic scientific and democratic practices-for example: willingness to openly and passionately debate issues, open to criticism, readiness to revise positions in the face of sound arguments and evidence, and so on. The session will frame the conversation in the larger context of twenty-first century democracy, the role of science in it, and centrality of a scientifically informed citizenry.

The session has two principle objectives:

1. The primary objective is to illustrate how explicitly integrating philosophical tools, epistemological as well as ethical, into some of the historical as well as contemporary milestone scientific debates can be used to model, and perhaps even strengthen, citizenship characteristics in modern, participatory democracy. This will be demonstrated by selecting examples from several areas of science, including critical debates from classical to contemporary physics-Galilean revolution through Einstein to Big Bang cosmology; debates over theory of evolution and teaching of Intelligent Design, stem cell research; and, the climate change debate.
2. And, a secondary objective is to make a case for appropriately (re)designing science curricula to explicitly integrate topics from philosophy of science from secondary schools to college. Teaching students to reflect on science and its practices from broad, philosophical perspectives, it will be argued, will help them better understand the nature of science and its methods.

Selected Recommended Readings:

Robert Audi. “Religion and the Politics of Science: Can Evolutionary Biology be Religiously Neutral?” *Philosophy & Social Criticism*, Vol. 35, No. 1-2, 23-50, 2009.

James Brown. *Who Rules in Science*? *An Opinionated Guide to the*

*Wars*. Harvard University Press, 2004.

John Dewey. *Public & Its Problems*.Swallow Press, 1954.

Timothy Ferris. The Science of Liberty: Democracy, Reason, and the Laws of Nature. Harper,

2010.

Steven Johnson. *The Invention of Air*: *A Story of Science, Faith, Revolution and The Birth of America*. Riverhead Books, 2008.

Philip Kitcher. *Science, Truth, and Democracy.* Oxford University Press,

2001.

*\_\_\_\_\_\_. Living with Darwin*: *Evolution, Design, and the Future of Faith*. Oxford University

Press, 2007.

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57 Issue 1, p18-37.

Peter Machamer, et al. *Scientific Controversies*. Oxford University Press, 2000.

Miller, S. Public understanding of science at a crossroads. *Public understanding of science*, 2001

Chris Mooney and Sheril Kirshenbaum. *Unscientific America*: *How Scientific Illiteracy Threatens Our Future*. Basic Books, 2009.

David N. Stamos. *Evolution and the Big Questions*: *Sex, Race, Religion, and Other Matters*.

Blackwell Publishing, 2008.

Harold Varmus. *The Art and Politics of Science*. W. W. Norton

Company, 2009.

Friedel Weinert. [*Copernicus, Darwin & Freud*](http://www.brad.ac.uk/ihs/CopernicusContents.htm)*: Revolutions in the*

*History and Philosophy of Science*. Wiley-Blackwell, 2009.

*Science, Evolution, and Creationism*. National Academy of Sciences, 2008.

<http://books.nap.edu/html/11876/SECbrochure.pdf>

Science and the Public. <http://www.centerforinquiry.net/>