Science and Pseudo-Science

- Demarcation of science from pseudo science (case study astrology)

- Literature: Ziman, Kitcher, Thagard
Definitions (OED)

- **Science** – systematic study through observation, experimentation, interpretation to the derivation of universal laws and theories
- **Natural Sciences** – the study of the nature of the material and physical universe (physics, chemistry, biology, geology, astronomy, etc.)
- **Social Sciences** – the study of society and the relationship of individual members within society (economics, history, political science, psychology, anthropology, sociology, etc.)
- **Technology** – the application of practical or mechanical sciences, usually to industry of commerce; the methods, theory and practice governing such applications

(*Vitenskap – science or branch of knowledge*)
Why should we be concerned about pseudo-science? (Ziman)

- Lack of public concern with the advancement of science
- Public’s “misunderstanding” of science
- Public’s preoccupation with the occult, paranormal, astrology
- Use of pseudo-science in marketing: “Detox”

Does the cock’s crow cause the sun to rise?
Case study: Science and Astrology

- History of astrology
- Are philosophical theories of science apply to distinguish astrology from other branches of science?
- Do they need to?
Astrology

- Zodiac established in 700 BC in Egypt, Chaldea
- Ptolemy (2 AD) *Tetrabiblos* and *Almagest*
- European Renaissance (14\textsuperscript{th}-16\textsuperscript{th} Century) – widespread rise in developments in arts
- Age of Enlightenment (17\textsuperscript{th} – 18\textsuperscript{th} century) – lost popularity
- Start of own renaissance in 1930’s
1975 statement by 192 scientists and 19 Nobel prize winners

Called for the rejection of astrology, arguing it was a pseudo-science because:

- Astrology originated as part of a magical world view
- The planets are too distant for there to be any physical foundation for astrology
- Astrology is incapable of making precise predictions
- People believe it merely out of longing for comfort
Counterarguments

- Origins are irrelevant to scientific status (e.g., chemistry and alchemy; medicine and witchcraft)
- Many “scientific” theories are based on a multitude of influences resting on tendencies rather than laws
- Astrology is still vaguely testable or verifiable (see Michael Gauquelin)
Other criticisms of astrology

- Resists falsification
- Non-progressive
- Non-critical
- Not "public knowledge"
- Not objective
- Can be replaced by a better theory (psychology, genetics, sociology)
"Technobabble": Brain Gym

- Educational Kinesiology
- Used in UK schools and approved by DHE
- Based on "massaging brain buttons"

Newsnight
Hugh Charles Sparker
Other Accusations of Pseudo-Science

- Homeopathy?
- Acupuncture?
- Detox?
- Telepathy?
- Extraterrestrials?
- Climate Change?
- Intelligent design?

Sammuel Hahnemann
Jorlaf Gjerstad.
Photo Frode Hansen

“Use angels and your own power to create miracles in your life”
Additional Literature

- "Bad Science" Ben Goldacre, 2006