

Hollywood Science

Week 2: Science in Popular Culture



VRIJE
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Faculty of
Humanities

A quick recap

Lecture 1

- Science & Arts
 - Two separate fields?
- Power of media
 - Power of fiction
- Mutual influence
 - Scientific discovery ('Canali on mars') inspiration for fiction
 - **Can it also be the other way around?**

A quick recap

The War of the Worlds (1953)

- Science?
 - Second World War
- Religion?
 - 'The littlest things'
- Stereotypes?
 - Dr. Clayton Forrester
 - Sylvia van Buren



Example: Ben Feringa (RUG), chemist



university of
 groningen

Nobel Prize for Ben Feringa



Ben Feringa, research program

“The research program of the Feringa group is focussed on synthetic and physical organic chemistry.

Inspired by Nature's principles of molecular assembly, recognition, transport, motion and catalysis, the goal is to exploit the full potential of synthetic chemistry to create **new structures and functions**.

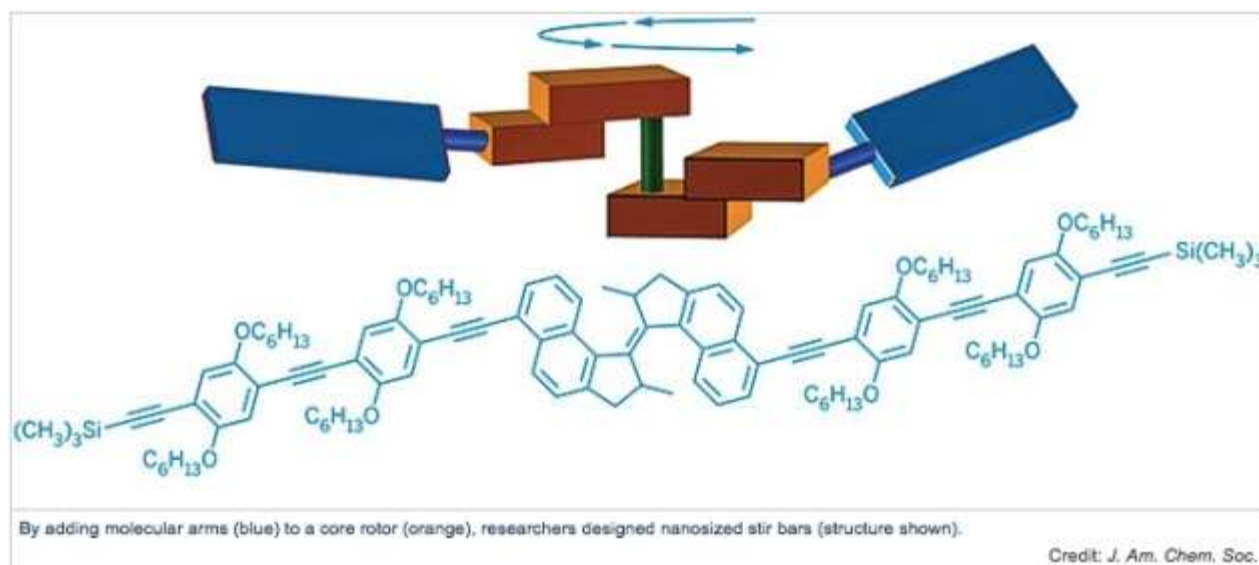
A major part of the research is directed towards **dynamic molecular systems**. The focus is on molecular nanoscience, novel responsive materials and photo-pharma exploring biohybrid systems, self-assembly, **molecular switches** and **motors**.”

Taken from: www.benferinga.com

Ben Feringa, molecular motors

“**Molecular motors:** how to control motion by exploring synthetic molecular motors. Light-driven rotary motors and catalytic motors are studied. The focus is on autonomous motion, the quest to make motors to perform work and the integration of molecular motors in **nano-mechanical systems.**”

- Drug delivery?
- Chemical reactions?
- Motor as metaphor



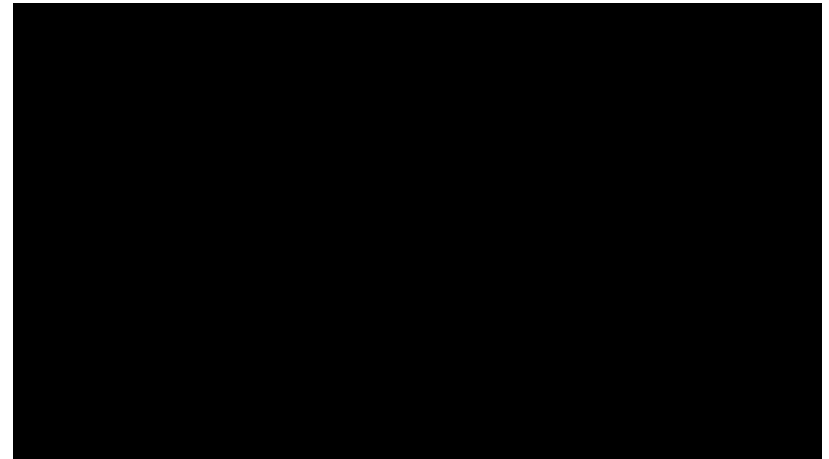
Taken from: <https://cen.acs.org/articles/92/i40/Molecular-Mixers.html>

Ben Feringa, reference to *Fantastic Voyage*

In his **Nobel Prize lecture**, Feringa referred to *Fantastic Voyage*, a film about a submarine crew that shrinks to microscopic size and venture into the body of an injured scientist to repair the damage to his brain.

[Lecture on YouTube](#)

Start at 00:32:53 minutes
(until 00:35:00)



Science Fiction influences Science

- “The best way to predict the future is to invent it” – Alan Kay

Nature's reference to *Fantastic Voyage*

“Meanwhile, inspired by the microscopic medical submarine of the cult 1966 film *Fantastic Voyage*, chemists have created an array of micrometre-sized particles and tubes that can zip through liquids like rockets.”

“Wang suggests that loading drugs or imaging compounds onto the rockets could deliver them into stomach tissue rapidly and effectively. “In the next five years we will move to practical *in vivo* applications,” he says. **“It really is the fantastic voyage.”**

Taken from: Peplow (2015)

Fantastic Voyage (1966), dir. Richard Fleischer

Summary

- Cold War
- Stolen technology
- Shrunk nuclear powered submarine



Made into a book:

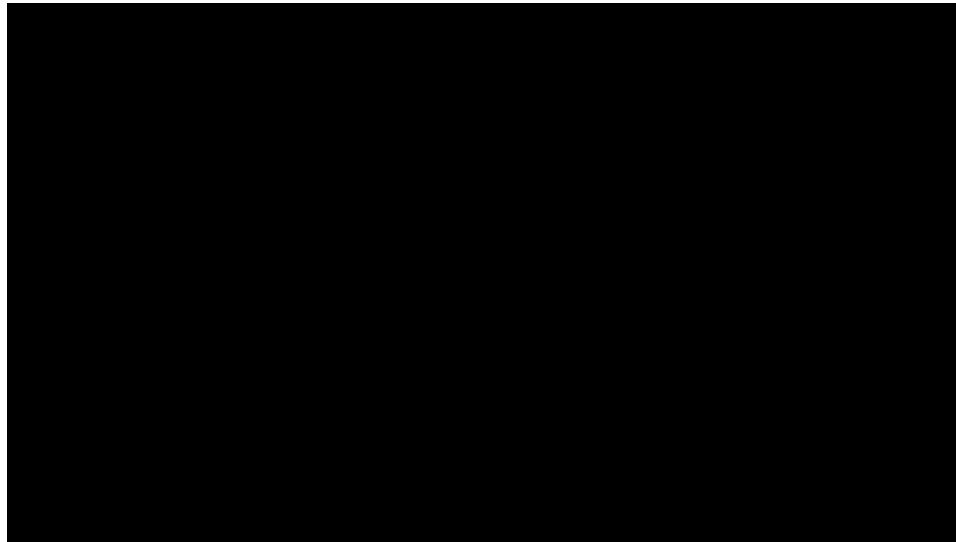
- *Fantastic Voyage* (1966)
by Isaac Asimov

Science influences Science Fiction

(Dubeck et al. 2004, p. 261-265)



Trailer: Fantastic Voyage (1966)

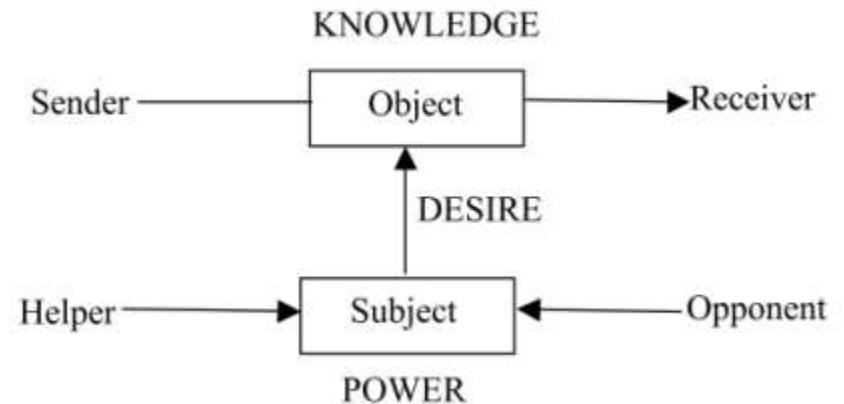


<https://www.youtube.com/watch?v=VcMwNSiQ8Jk>

Fantastic Voyage (1966), dir. Richard Fleischer

Themes

- A 'Fantastic Voyage'
- *Odyssey?*
- Verne's *Twenty Thousand Leagues under the Sea* (1970)
- Shrinkage
- Biotourism
- Sexism?



MATT DAMON
DOWNsizing



Sci-Fi influencing Technology

Other examples: Science Fiction becoming ‘Science Fact’

- “[...] the inventor of the first **liquid-fuelled rocket**, American Robert H. Goddard, was inspired by H.G. Wells’ science fiction novel *War of the Worlds* (1898).”
- “Similarly, the **tablet computer** actually first appeared in Stanley Kubrick’s *2001: A Space Odyssey* (1968) [...]”
- “[...] and the communicator— which we’ve come to refer today as **the mobile phone** – was first used by Captain Kirk in *Star Trek* (1966).”



Emmanuel Tseklevs, “Science fiction as fact: how desires drive discoveries.” *The Guardian*, 13 August 2015, <https://www.theguardian.com/media-network/2015/aug/13/science-fiction-reality-predicts-future-technology>

Sci-Fi influencing Technology

“Therefore science fiction, or what the design world refers to as design fiction, isn’t fiction but a technique for thinking ahead, predicting future technologies, potentially influencing policy, but most importantly creating debate by **asking what if?**”

In this way, science fiction can be used as a tool to **help design future societies and technologies**, giving the public a say on it too.”

Emmanuel Tseklevs, “Science fiction as fact: how desires drive discoveries.” *The Guardian*, 13 August 2015, <https://www.theguardian.com/media-network/2015/aug/13/science-fiction-reality-predicts-future-technology>

Sci-Fi influencing Technology

Further reading:

- Lorraine Longhi, "Science fiction: Shaping the future". *Knowledge Enterprise Development ASU*, <https://research.asu.edu/stories/read/science-fiction-shaping-future>
- Cory Doctorow, "I've Created a Monster!". *Slate*, May 2017, www.slate.com/articles/technology/future_tense/2017/05/sci-fi_doesn_t_predict_the_future_it_influences_it.html

Analysis: Intertextuality

Definition:

- “**Intertextuality** denotes the way in which texts (any text, not just literature) gain meaning through their referencing or evocation of other texts.” (Novak, 2013)

Examples:

- Tolkien (*Lord of The Rings*) borrowing themes from Mediaeval English Literature
- A chemist referring to a movie
- Parody or pastiche

Analysis: Intertextuality

To:

- Create relations **between** texts

Ask yourself:

- Why is this intertextuality established?
 - Why did Nature and Feringa refer to *Fantastic Voyage*?
- How is it used, meaning?
 - How was this movie reference used?
- Effect?
 - What was the effect of the reference?

Analysis: Identification

Definition:

- **Identification** is “[t]he (frequently unconscious) adaptation of one's ideas and behaviour to accord or conform with those of a person or group seen as a model” (OED Third edition)
 - Result: feeling of close emotional and/or intellectual association.

To:

- Depends on the object
 - Make something more appealing
 - Establish common ground

Ask yourself:

- How is this identification established?
- Why is it used?
- Effect?

Analysis: Intertextuality and identification

In the case of *Fantastic Voyage* (1961):

- Analogy/correspondence science and a film work
- Shared **conceptual horizon**
 - To illustrate how his technique works
 - Making it easier to understand?
- Related to the **History of Technology**
 - From fiction to reality
- Honour the spirit of the film's scientists
- Evokes the image of the scientist as an entrepreneur, an **adventurer**, and a hero
 - Narrative → Science as an adventure

This course: Representation of science in films

Hypothesis:

- Science in film had and still has an huge impact on the general (public) appraisal of the meaning and function of science in our society.

Looking at:

- Dissemination (of Knowledge)
- Popular culture
 - Science in society.

Movies play a large role in defining the image of science in society. At the same time, movies are shaped by society. It is a two way stream.

Wrap-up: Two fields still exist

Science	Fiction (Arts ...)
Strict methodological rules, experimenting and explaining	No strict rules, 'free' , interpreting and understanding
Conceptualization of facts, empirical data & manipulating nature	Conceptualization and manipulation of everything: feeling, vision, attitude, thinking, dreaming, being, sound...
'Democratic', transparant, lucid, certain, coherent, logic	Opaque, enigmatic, uncertain, incoherent, a-logic...
<i>Creative, adventurous , beautiful, fullfilling</i>	<i>Creative, adventurous, beautiful, fullfilling</i>

Sidney Perkowitz: *Hollywood Science*

Genre problem Science Fiction

“Science fiction has proved notoriously difficult to define. It has variously been explained as a **combination of romance, science, and prophecy** (Hugo Gernsback), ‘realistic speculation about **future events**’ (Robert Heinlein), and a genre based on an **imagined alternative to the reader’s environment** (Darko Suvin). It has been called a form of **fantastic fiction** and an **historical literature**.”

(Seed, p. 1)

“It is helpful to think of an SF narrative as an embodied thought experiment whereby aspects of our familiar reality are transformed or **suspended**.”

(Seed, p. 2)

“[...] it consists of stories that extrapolate known science to ask ‘**what if?**’”

(Perkowitz, p. 6)

Sidney Perkowitz: *Hollywood Science*

Definition:

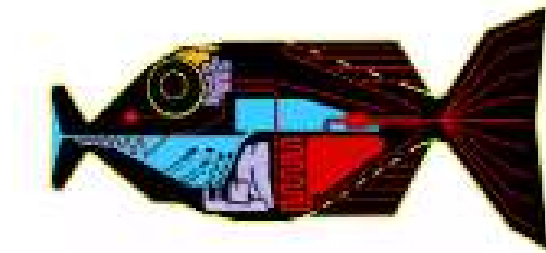
- “Fiction in which the setting and story feature hypothetical **scientific or technological** advances, the existence of alien life, space or time travel, **etc.**, esp. **such fiction set in the future**, or an **imagined alternative universe.**” (OED, Third edition)
- Hard Science Fiction
 - Technological, analytical, strict
 - Exact/Hard sciences
- Soft Science Fiction
 - Magical, intuitive, loose
 - Soft sciences

(Roberts 2016)

Sidney Perkowitz: *Hollywood Science vs. Real Science*

Chapter 10

- Bad science? Misinformation? Does this matter?
 - Film vs. Documentary
 - Still obeying nature's laws?
- Science <-> (Science) Fiction
- Entertainment != accurate



“At one level, these films educate informally by presenting ideas like emerging viruses and black holes. But when the filmmaker’s first commitment is to tell an entertaining story, **there’s little guarantee that the science is accurate.** That may not affect the inspirational value of these films, but mistakes or deliberate distortion can do more harm than good to science literacy and public understanding of science.” (p. 217-218)

Sidney Perkowitz: *Hollywood Science vs. Real Science*

Chapter 10

- Science fiction (p. 219)

“[...] illustrating that audiences do want a degree of verisimilitude:
people can suspend only so much disbelief (p. 219)

- Referentiality
 - Mimesis
 - Fictionalise
 - To:
 - Boost ‘reader’s emersion in the narrative/story
 - Entertainment!
- Trade-off!

Sidney Perkowitz: *Hollywood Science*

“It’s true that **we groan and complain** when a science fiction film shows incorrect science or caricatures of scientists” (p. ix)

Sidney Perkowitz: *Hollywood Science*



The mad scientist

Perkowitz and Superman analysis

Sidney Perkowitz: *Scientists as Heroes, Nerds and Villains*

Chapter 8

Stereotypes

- Scientist as authority (p. 168)
- Scientist as social outcast (p. 171)
- Male/female scientists

“[...] because even when a female scientist appears, she may play a secondary part” (p. 186)



Dana Scully, The X-Files

Sidney Perkowitz: *Scientists as Heroes, Nerds and Villains*

Chapter 8

Stereotypes

Three (stereo)types (cf. James Cameron, p. 172):

1. Nerd
2. Villain → Mad Scientist
3. Hero



Evil Genius game, 2004

Sidney Perkowitz: *Scientists as Heroes, Nerds and Villains*

Mad scientist

“[...] the madness is being driven by the thirst for knowledge [...]” (p. 177)

- Villains develop along with new sciences (p. 180)
 - Rise of genetic engineering (example: Mengele)
- Stereotypes
 - How are scientists represented?
 - Female / male?
 - Attitude?



Alchemist/Scientist Rotwang from *Metropolis* (1927)

Superman – *The Mad Scientist* (1941)



https://www.youtube.com/watch?v=_frD6bGp63U

September 26, 1941

Episode: 1 (of 17)

First Appearance: Superman, Clark Kent, Lois Lane

Produced by Fleischer Studios and released by Paramount Pictures

Superman – *The Mad Scientist* (1941)

- **Mythology**
 - Superman coming from Krypton on Earth
- **Scientist disturbing the Societal Order**
 - Letter forecasting total destruction by a beam
- **Detective/crime**
 - Investigation Attempt 1: Female journalist
 - Attack 1: on the Suspension Bridge
 - Investigation Attempt 2: Superman / male journalist
 - Attack 2: on the building of the Newspaper Company
 - Success of Superman, Capture of the Scientist
- **In the end:**
 - All's well that ends well: Restoration of the Societal Order

Superman – *The Mad Scientist* (1941)

“Electro-thanasia ray”

New (composite) word with ‘blurry’ reference!

- electro
 - Latin: *electrum* (amber) or Greek *elektron* (energy)
- thanasia
 - Greek: *thanatos* (death, associations with ‘death’ and ‘violence’)
 - Freud’s Death Drive (*Todestrieb/Thanatos*)?

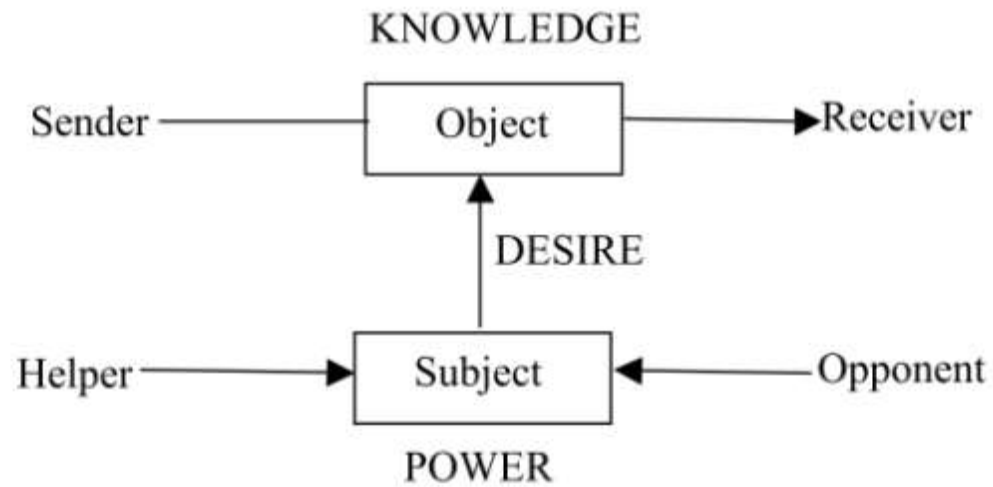
Narrative: structured by Opposition

Male Characters:	
Superman	Mad Scientist: without a name!
Non Human/Human, Strong, Brave, Responsible, Member of a Team (<i>Daily Planet</i>)	Human?, Brilliant Technician, Organiser, Individual
Lucid, Responsible, Safekeeper, Rational	Weird, Irresponsible, Striving for World Domination, Disruption the Order, 'Uncanny'
Good (in ethical and/or juridical and/or societal terms)	Bad (although clever)

Narrative: Opposition

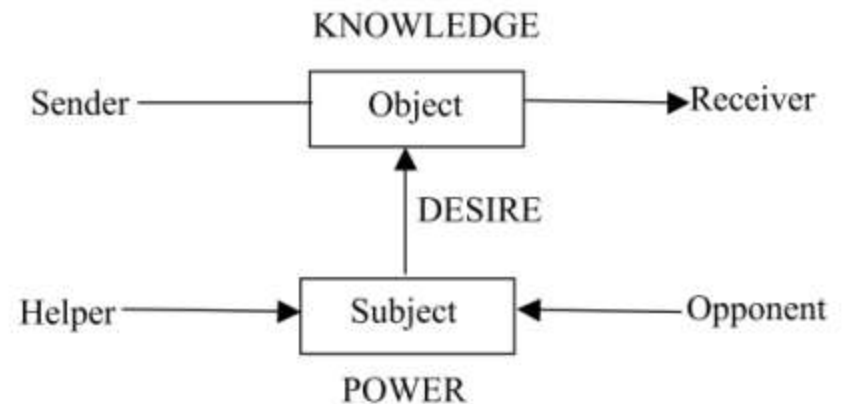
<i>Location or Space:</i>	
Superman	Mad Scientist
Modern City (Working Life) Metropolis	Isolated Rock, (Gothic?) Castle with 'industrial aspects' - factory, Machines (no furniture)

Actantial model (Greimas)



Actantial model (Greimas)

- Subject: Superman
- Object: Restoration of order
- Sender: Letter/danger from mad scientist
- Receiver: Society
- Helper: Louis Lane
- Opponent: Mad Scientist



Superman – *The Mad Scientist* (1941) - Source?

- Nikola Tesla (1856-1943)
- Tesla Tower
 - Tesla sitting in his Colorado Springs laboratory with his *magnifying transmitter* generating millions of volts.
- War of the currents
 - AC/DC
 - Thomas Edison

Further reading:

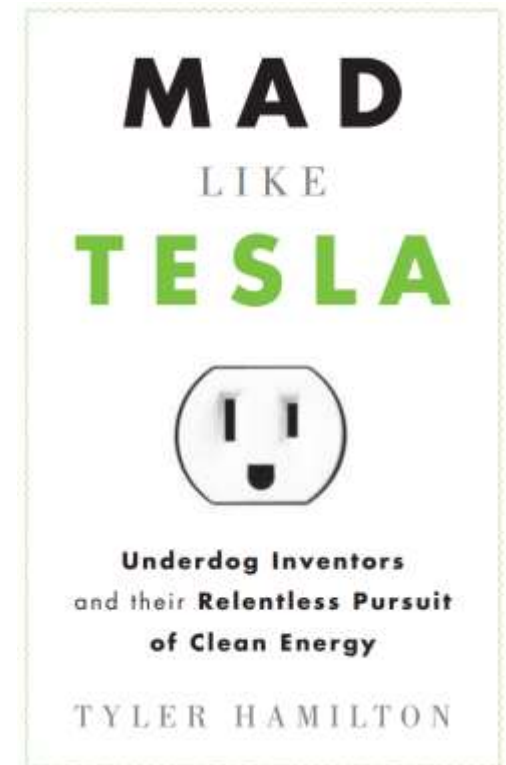
- <https://www.nytimes.com/1979/02/06/archives/war-of-the-currents-had-profound-impact-the-war-of-the-currents-had.html>
- <https://www.energy.gov/edison-vs-tesla>



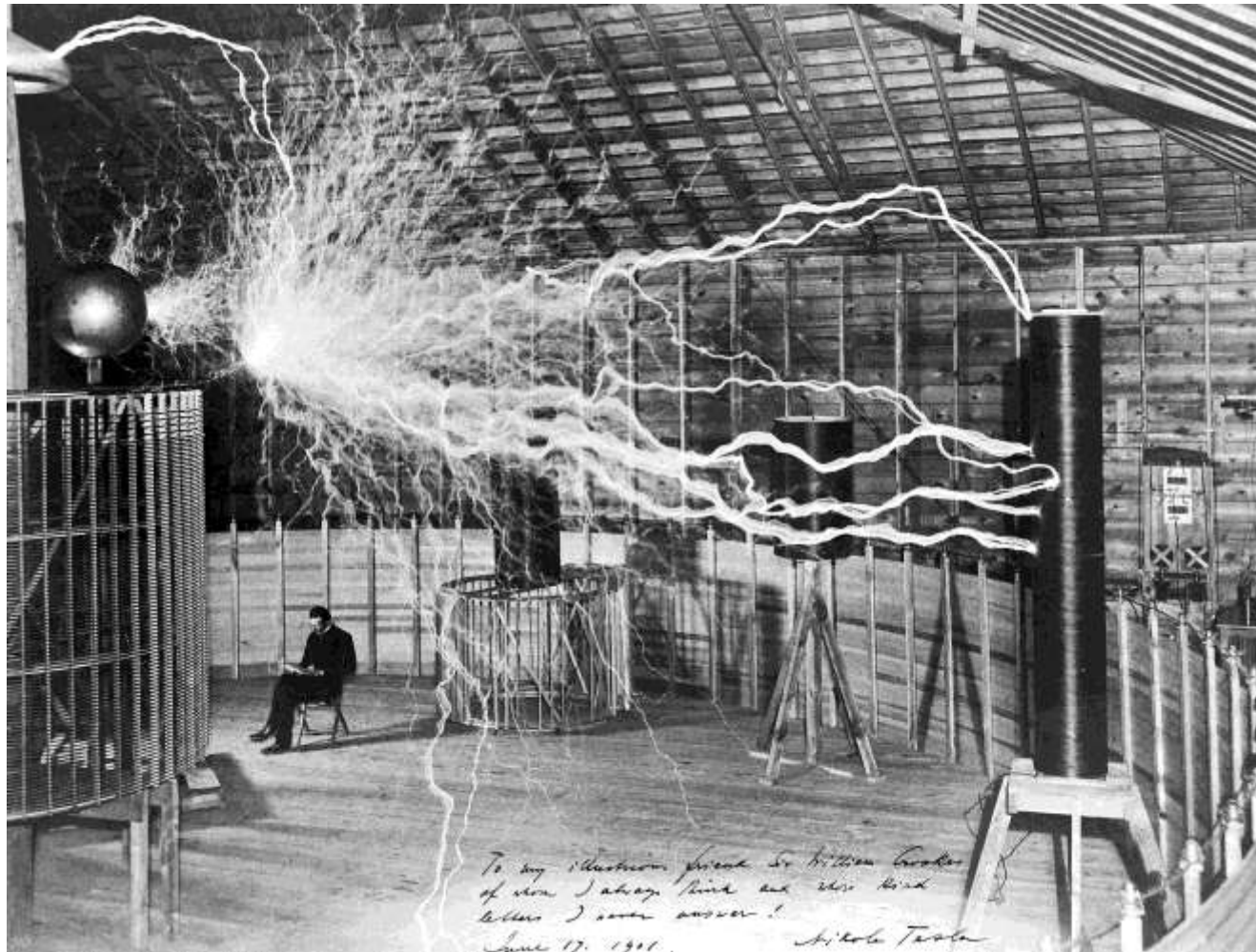
Superman – *The Mad Scientist* (1941) - Nikola Tesla

“Instead of being hailed as a genius and brilliant inventor, Tesla was increasingly thought of as a **“mad scientist”** in the minds of the general public and in popular culture.”
(Hamilton, p. 14)

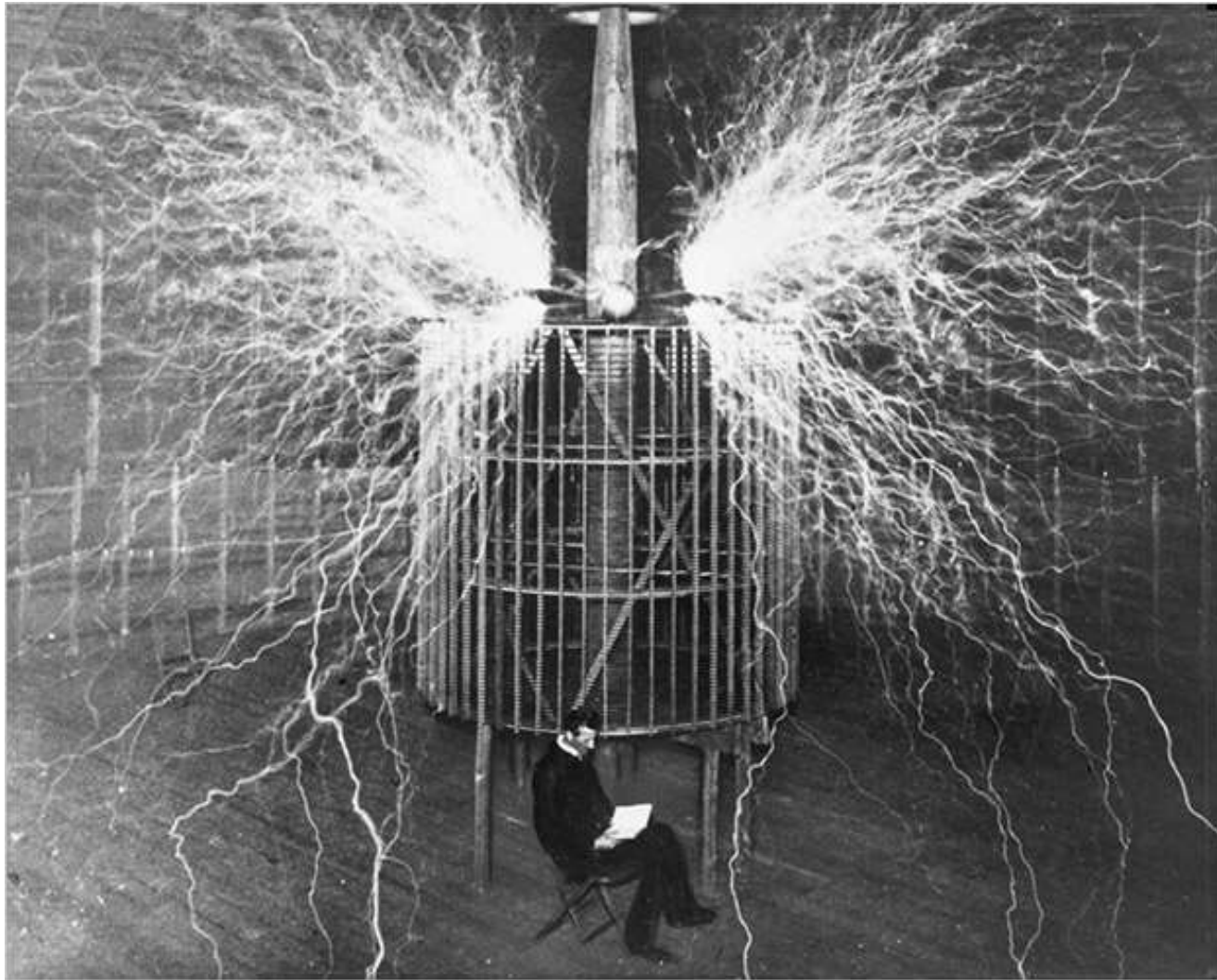
“Newspaper reporters, looking for a laugh, would attend to listen to the crazy old man’s outlandish **predictions of wireless telephones, communication with other life forms** in the cosmos, **beam weapons** that could shoot down airplanes and missiles, and **many more science fiction concepts that are now becoming reality.**” (Uth in Hamilton, p. 14)



Tesla



Tesla



References

- Doctorow, Cory, "I've Created a Monster!". *Slate*, May 2017, www.slate.com/articles/technology/future_tense/2017/05/sci_fi_doesn_t_predict_the_future_it_influences_it.html
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