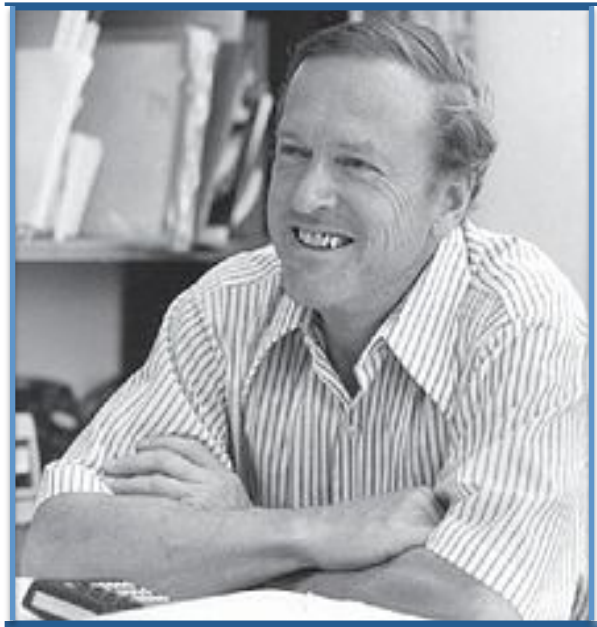


The Gold Effect: An enhancement of misconceptions



A scientific idea that is developed to the status of an accepted position by the social process of scientific conferences, committees, and consensus building, despite not being supported by conclusive evidence

If you don't miss a flight now and then you are probably spending too much time waiting around at airports.

Ken Kellermann, NRAO

The Labyrinth of the Unexpected
Kerastari, Greece
June 2017



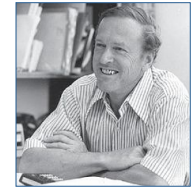
Associated
Universities, Inc.

Atacama Large Millimeter/submillimeter Array
Karl G. Jansky Very Large Array
Robert C. Byrd Green Bank Telescope
Very Long Baseline Array



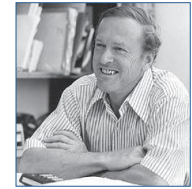
The Gold Effect:

An enhancement of misconceptions

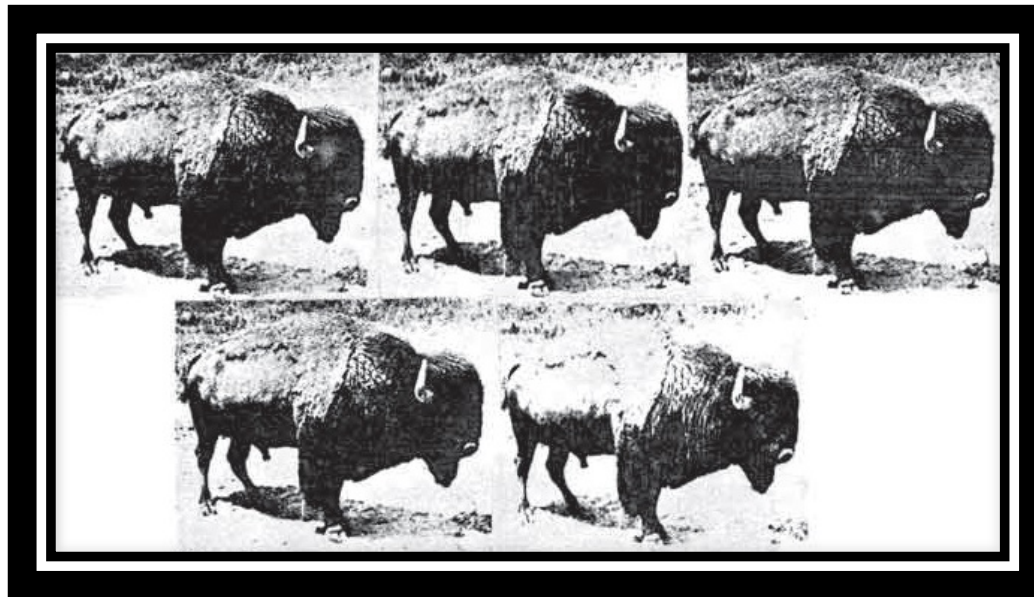


- New ideas in science are not always right just because they are new
- Nor are old ideas wrong just because they are old.
- A critical attitude to new ideas is clearly required
- **What is also required is an equally critical attitude to old ideas**

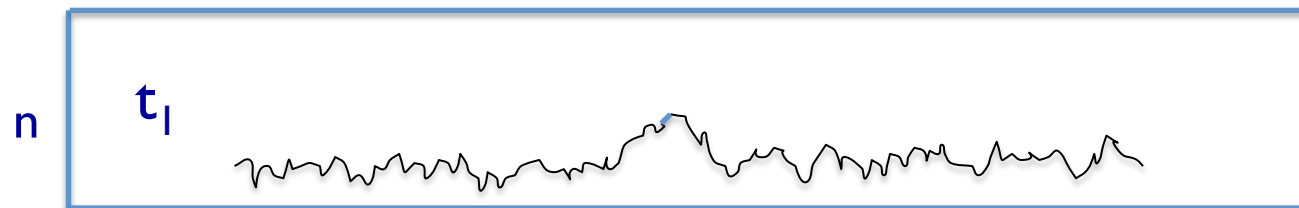
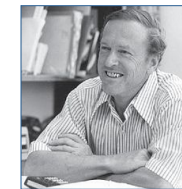
The Bandwagon Effect aka Buffalo Syndrome



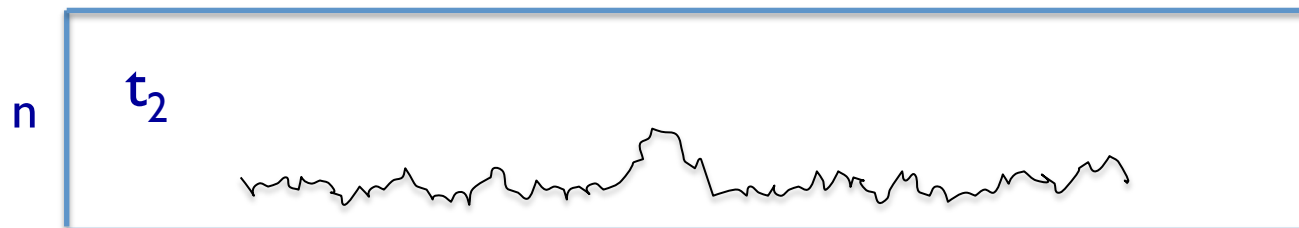
John Broderick: Radio Astronomers are like a herd of buffalo. They go thundering off in any direction following the lead of a head buffalo who may not know where he is going.



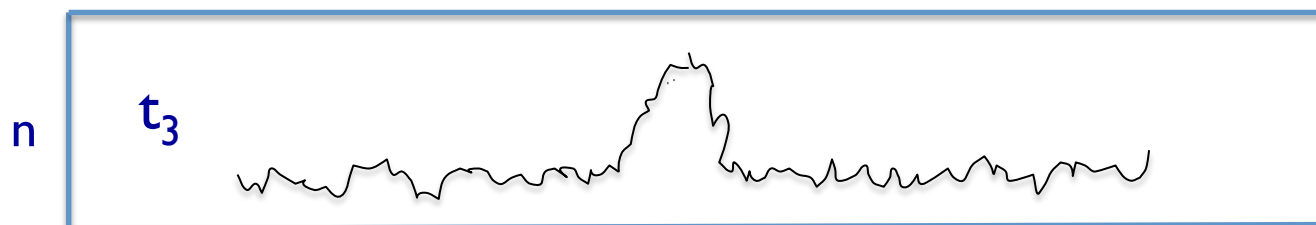
Simulated buffalo herd



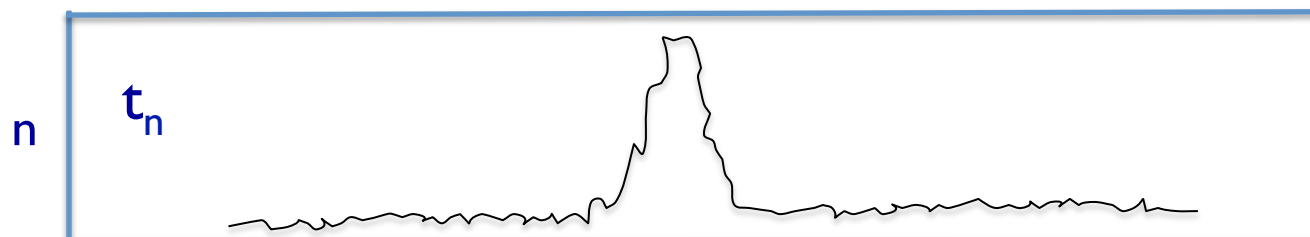
Opinion space



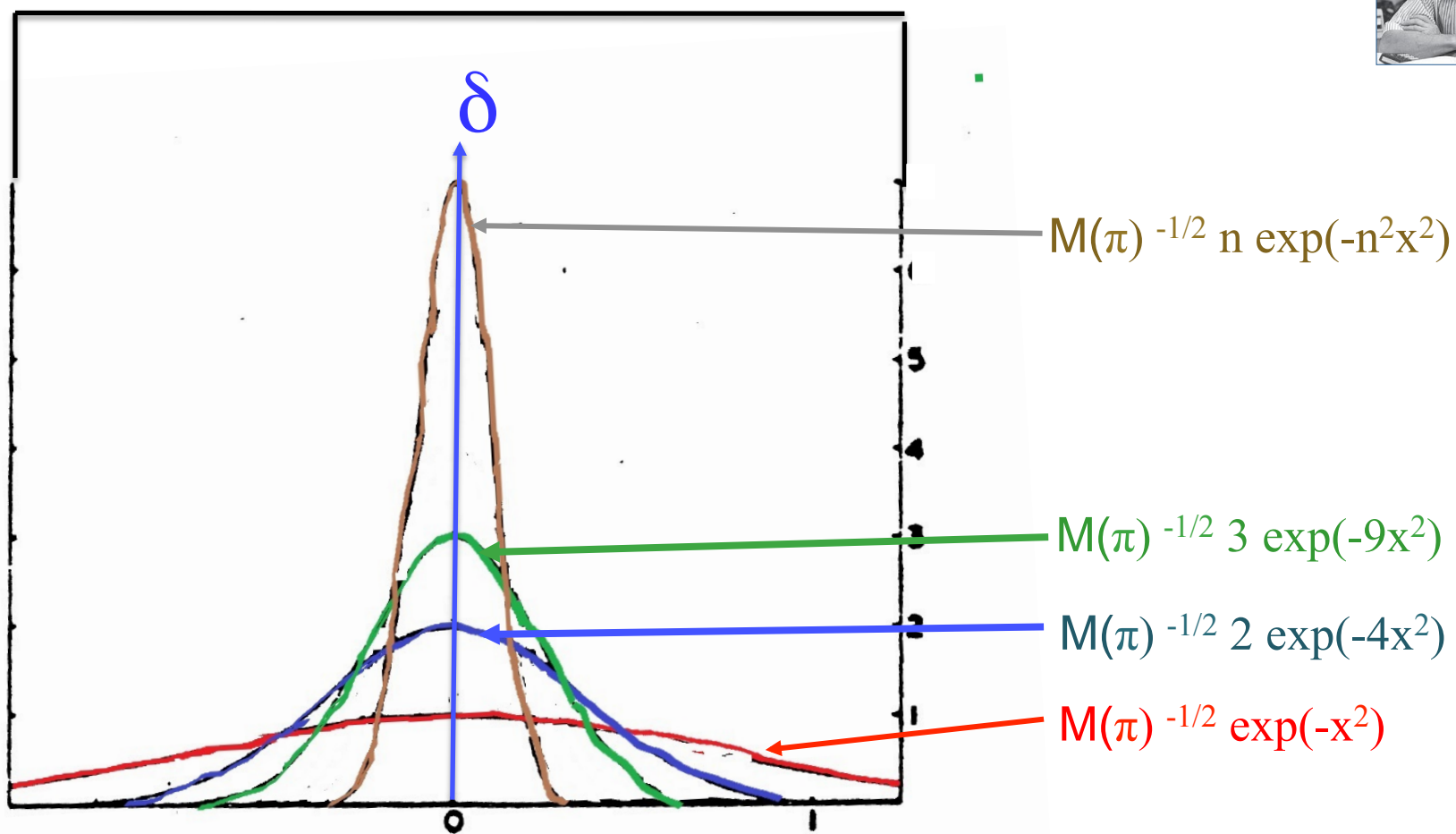
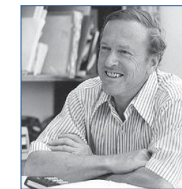
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Opinion space

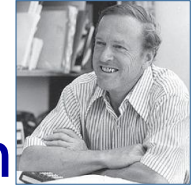


Opinion space



Littleton, in "Lying Truths" Pergamon Press, 1990

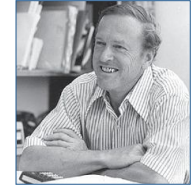
Peer Review



- What you are allowed and not allowed to publish
- What you are allowed to say
 - Conference SOC's
 - Invited talks
 - Contributed talks
- What you are allowed to observe ---TACs
 - Explain what you expect to find
- What research you can do -- Grant proposals
- Where you can work
 - Job applications – research plan
- Tenure considerations

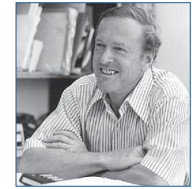


What is a scientist?



- A person who
 - Contributes to science
 - Judgement dependent only on his understanding of the evidence
 - Judgement based on the totality of evidence available
 - Judgement unaffected by the judgement of other people
 - Judgement unaffected by his perception of how it will be received
 - Not influenced by consideration of how his judgement will affect his standing in the profession, promotion, financial position, or friendships
- Limits the number of people who are pure scientist (null class?)
- In practice, scientists have a motivation beyond curiosity
 - Handicap in seeking truth
 - Sum of non scientific judgement impacts views of the community

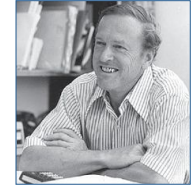
What are factors which limit scientists from behaving like scientists?



- Unwillingness to learn new things
- The herd instinct (buffalo syndrome)
 - Anyone who departs from the herd may find himself alone or face ridicule
 - Structure of support for science: Those who don't join the herd are cut out.
 - To run with the crowd seems to give people the feeling of comfort and security.
- “If moral or financial support from peers, is important, then staying with the herd is the successful strategy”
 - “successful,” that is, for this limited purpose, but not for the pursuit of science.
- The need to justify the cost of our instruments may lead to over-interpretation of inconclusive or expected results
 - Obsessive advertising of desired instruments e.g., SKA



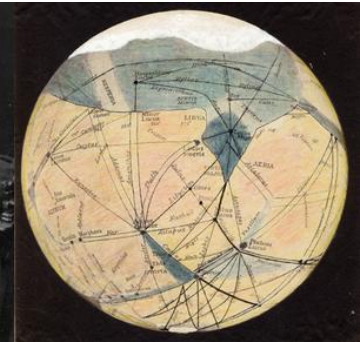
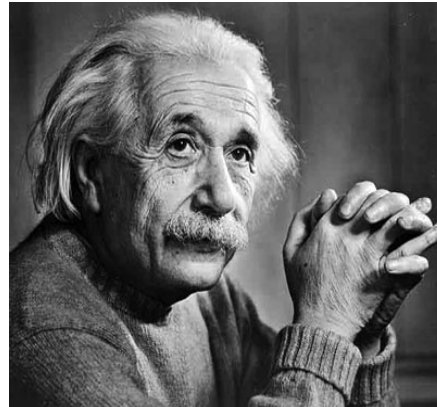
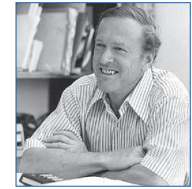
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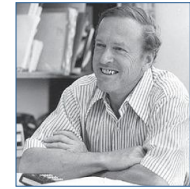
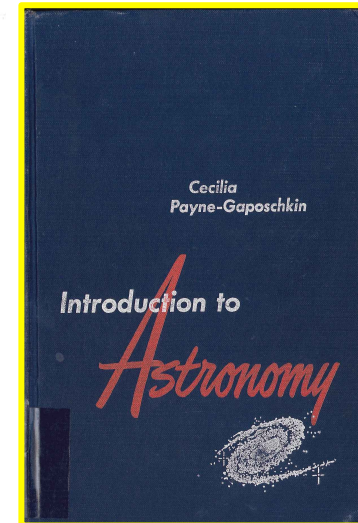
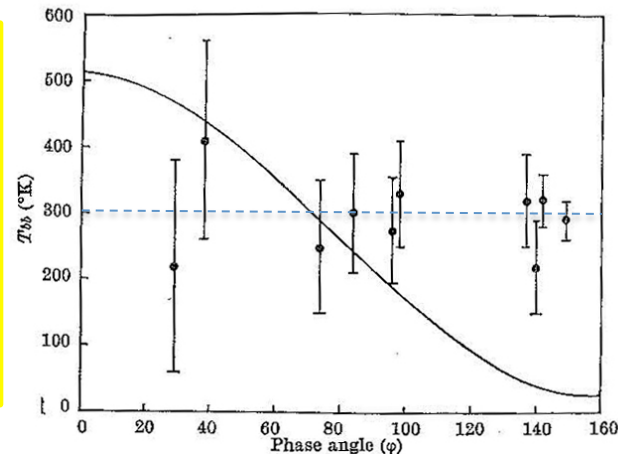
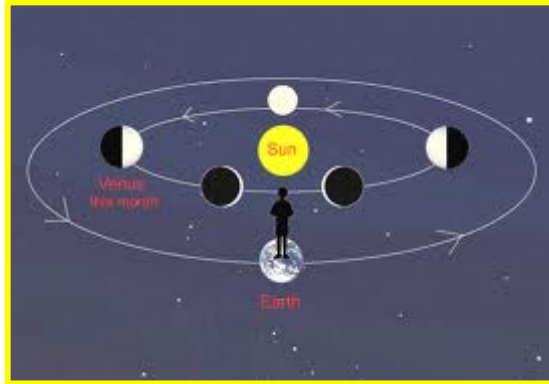
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Examples of the Gold Effect

- Ptolemaic astronomy and epicycles
- Aether
- Vulcan
- Phlogiston
- Martian Canals
- Static Universe
- **Rotation of Mercury**

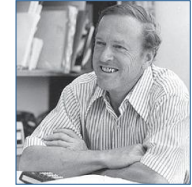


Rotation of Mercury



The sun beats fiercely on the face of Mercury; Mercury always turns the same face to the sun, and so one side of the planet is in continual sunlight; the other is in perpetual shadow. Under the sun's rays the surface of Mercury is kept at a temperature near 600 K. But the other side of the planet is in eternal darkness, and its temperature cannot be far from absolute zero.

Are there any current misconceptions?



Cosmology

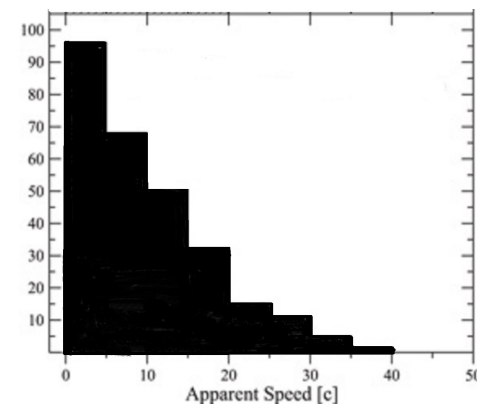
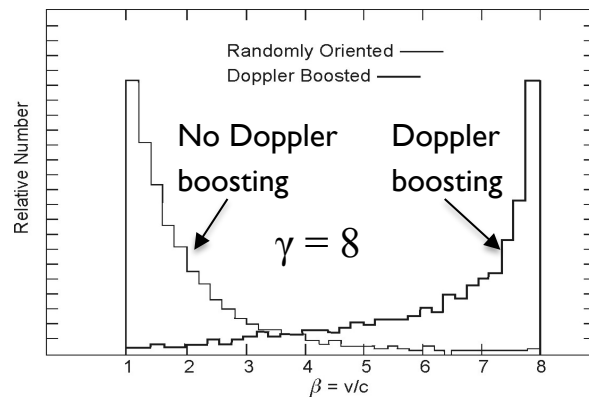
- Hoyle: “Big bang cosmology can explain anything based on what we observe now was caused by an earlier state ... and so on, back to the beginning which is not explained.”
- Gold: “The Universe is what it is because it was what it was.”
 - Deceleration Constant. $q_0 \equiv 1/H_0^2 (R/R)_0$
 - Big Bang: $0 < q_0 < 1$
 - Steady State: $q_0 = -1$
 - What if SN Hubble relation discovered before CMB?
 - Confirmation of SS model
 - Quasi SS model
 - BB and inflation



Other Current Misconceptions?



- Quasars driven by accretion onto a Super Massive Black Holes
- Superluminal motion & $T \geq 10^{11-12}$ IC Limit \rightarrow Relativistic Beaming
- Problems
 - 3C 273 High T_b (RadioAstron) $> 10^{14}$ K ($\gamma \sim 100$)
 - Distribution of apparent apparent velocities



Lister et al. 2016

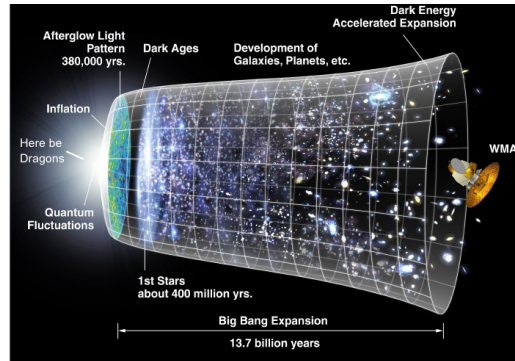
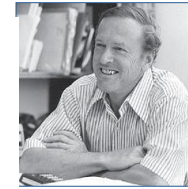
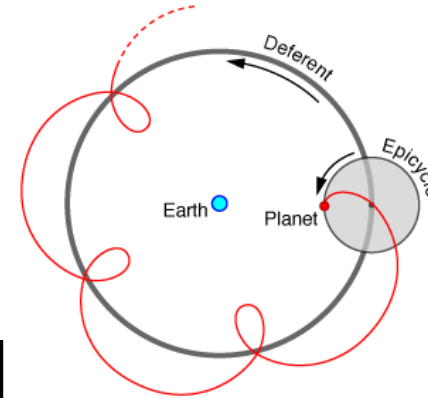
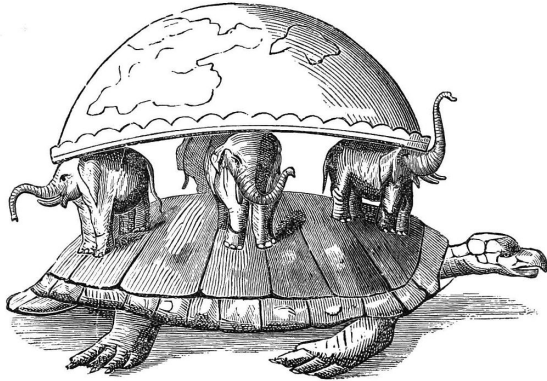
— $(v/c)_{\text{pattern}} \neq (v/c)_{\text{flow}}$ (superluminal motion shocks not bulk motion)

SETI



- Small slice of cosmic time - 21 cm, no 21 cm, H₂O hole, astro-engineering, IR, γ -ray, neutrinos, gravity waves
- UHF TV Eavesdropping \longrightarrow Cable, WiFi
- Unable to predict natural phenomena
 - quasars
 - pulsars
 - FRBs
 - cosmic masers
 - dark matter and energy.
- Why do we think we understand technology or sociology of extraterrestrials well enough to predict their behavior?





Man has always thought he understood the Universe.
Why is the present time any different from past misconceptions?
Fred Hoyle



