

Dayton Miller's Ether- Drift Experiments: A Fresh Look

***Society for Scientific Exploration,
Conference, June 2006***

**James DeMeo, Ph.D.
orgonelab.org/miller.htm**



**Albert
Michelson
1852-1931**



**Dayton
Miller
1866-1941**

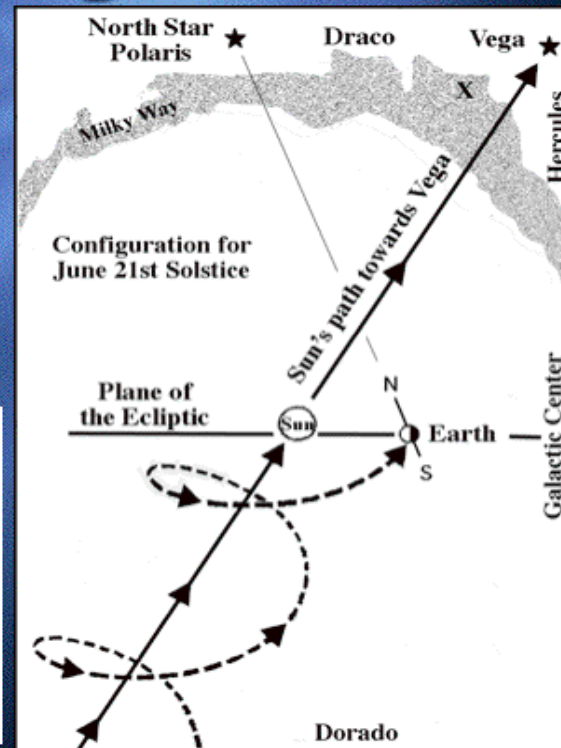
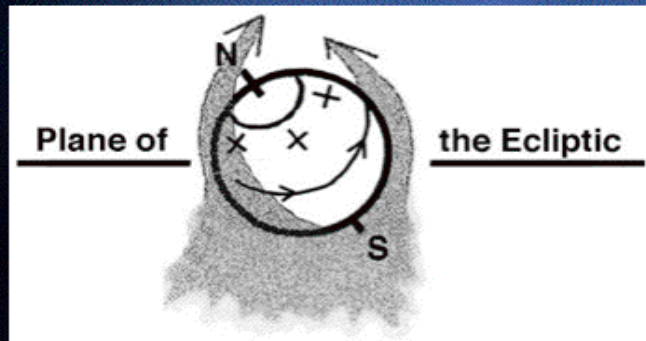
J.DeMeo: *"Evidence for the Existence of a Principle of Atmospheric Continuity", Univ. of Kansas, 1979*

- ⊕ Review of all known Ether-Drift Experiments
- ⊕ Archive research at Case-Western Reserve Univ. Cleveland; Einstein Archive, Jerusalem; Mt. Wilson.
- ⊕ Natural Philosophy Alliance
- ⊕ 40 yrs Amateur Astronomer, Observatory 16" Newtonian

Date	Experimenter	Notes	+/- Evidence for Aether:	
			Static?	Dynamic?
1882	Michelson	58% of that for static aether	-	+
1887	Michelson, Morley	24% of that for static aether	-	+
1904	Morley, Miller	1.3% that for static aether	-	+
1902	Trouton, Nobel		-	?
1904	Rayleigh		-	?
1904	Brace		-	?
1905	Morley, Miller	larger than 1904	-	+
1913	Sagnac		?	+
1915	Zeeman		?	+
1919	Righi		?	+
1921	Miller		?	+
1923	Miller	20-38% of that for static aether	-	+
1925	Michelson	Metal dome, Mt. Wilson Obs.	-	?
1926	Kennedy		?	+
1926	Piccard, Stahl		-	?
1927	Illingsworth		?	+
1927	Michelson		-	+
1933	Miller	Summary, 1926	-	+
1938	Stilwell, Ives	doppler effect	-	+
1952	Ditchburn, Heavens	Radiowaves	-	?
1955	Essen	Radiowaves	-	?
1963	Townes, et al	Laser light	-	?

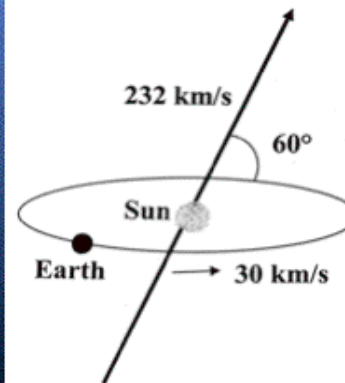
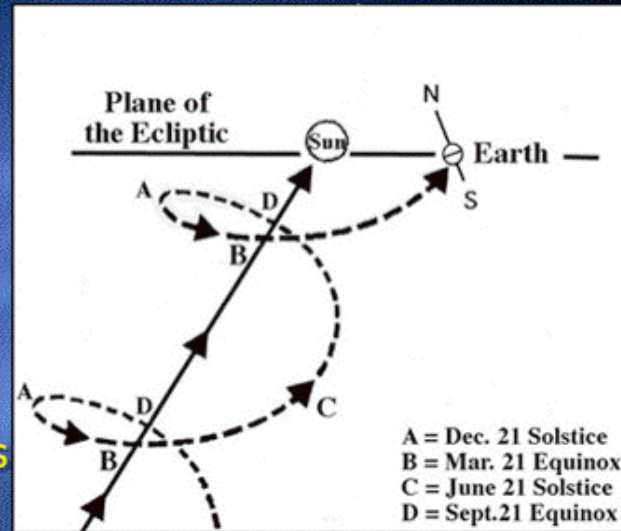
DeMeo's Integration

- ⊕ Based upon the work of Wilhelm Reich, Giorgio Piccardi, Dayton Miller, etc. & modern cosmology.
- ⊕ Focus: spatial relationships, ordinary language, common sense & minimal maths



Cosmic Motions

- ✦ Earth Rotation on Axis: ~1670 kph or 0.464 kps at equator (zero at poles).
- ✦ Earth Revolution around Sun: ~30 kps
- ✦ Solar Motion through Galaxy (Vega): ~17-300 kps
- ✦ BUT: Plane of Ecliptic $\sim 60^\circ$ to Solar Motion
- ✦ Net Motion is helicoidal
- ✦ Velocity Max. ~ 2 June
- ✦ Velocity Min. ~ 2 December
- ✦ Acceleration in March-June, deceleration in Oct.-Dec., (relative to Sun).



Why Ether? - I

- ⊕ Light properties suggest a medium:
reflection, refraction, interference...
- ⊕ Particulate theories of light problematic, ever-more complicated, metaphysical.
- ⊕ Wave theory more useful to engineers.
- ⊕ **Good experimental evidence for ether was chronically ignored, politically...**
- ⊕ Evidence deflates AE's relativity, "big-bang" creationism, aspects of QED, etc.

Why Ether? - II

- ⊕ Mainstream & Anomalies Research suggests "empty space" is an energy-rich substrate or an

Interconnecting Medium or Continua:

DeBroglie: Neutrino Sea (35,000,000/sec/cm³+++)

Alfven: Cosmic Plasmas

Bernabei: Dark Matter Wind

Puthoff: Zero Point Vacuum

Reich: Orgone Energy Continuum

Piccardi: Cosmical Dynamic Energy

Burr: Electrodynamical Field

Brown: Exogenic Biological Clocks

PSI/ESP: Psychokinesis, Intention

Other: "Interstellar Medium", "Stellar Wind"

Ether-Concepts:

- ⊕ Aristotle: *Prime Mover* - Deity
- ⊕ Galileo: Nature moves, *Ether* has dynamic motion, energy, participates in the motion & order of the heavens. *Deity Irrelevant*
- ⊕ Newton: *Absolute Space, nothing moves unless something else makes it move (1st Law) - Deity moves nature, not ether.*
- ⊕ Einstein: Space Void, Ether abstract or non-existent
- ⊕ Michelson-Morley-Miller: Ether-wind, tangible, entrained
- ⊕ Reich, Piccardi, Burr: Cosmic energy moves, affects light, matter, planets, chemistry, weather, people, life, etc.

Static Ether Theory

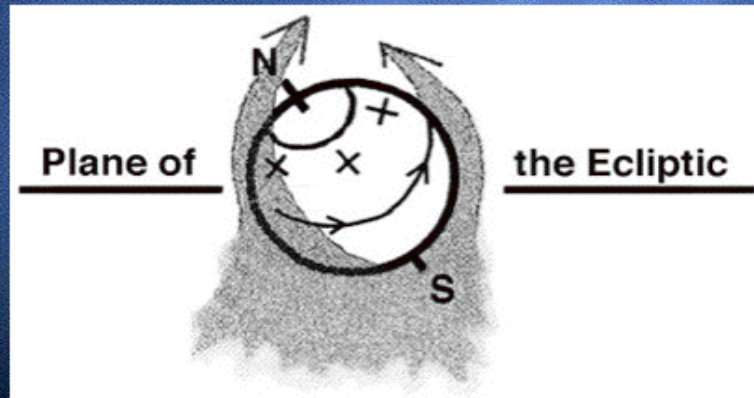
- ✦ Earth races through the cosmic ether like a projectile moving through the air at high velocity.



Where did the "explosive" energy come from?
Why doesn't the "projectile" frictionally slow down?
Important Questions, but *Wrong Starting Assumptions!*

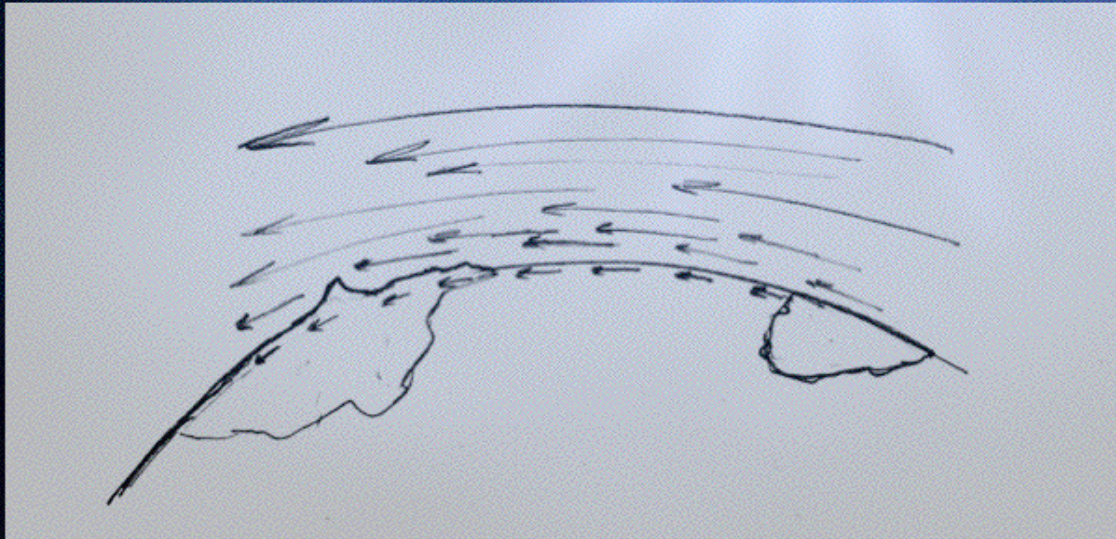
Dynamic-Substantive Ether Theories

- ⊕ Planets, stars move through ether close to the same speed.
- ⊕ Ether is in motion and moves or affects the planets & stars, nebulae, galaxies, etc. Swirling, Spiraling, Superimposition.



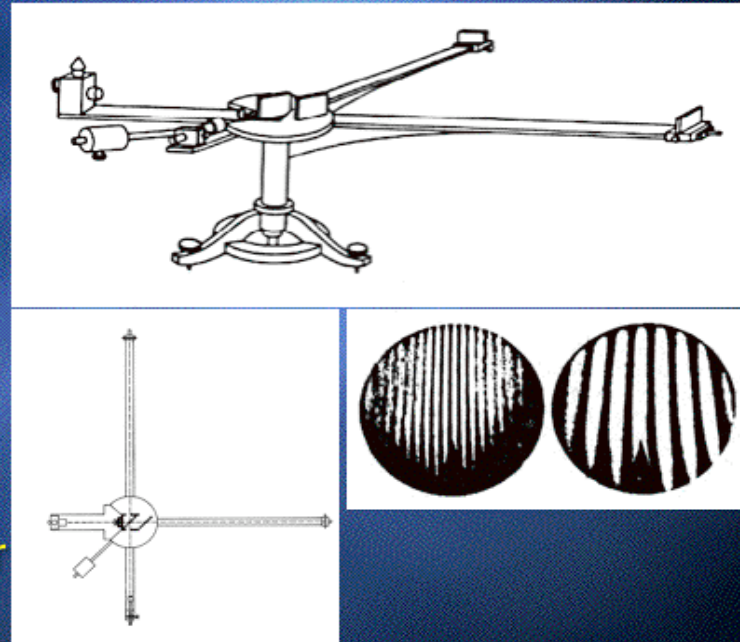
Ether-Entrainment

- ✦ Ether has slight mass, and therefore interacts with matter
—> *Ether-Wind, or Ether-Drag*. Sim. “Laminar flow” hydrodynamics.
- ✦ Earth-ether speed reduced relative to background cosmical motions
- ✦ Ether-wind faster at higher altitudes, similar to air-wind



Michelson Interferometer

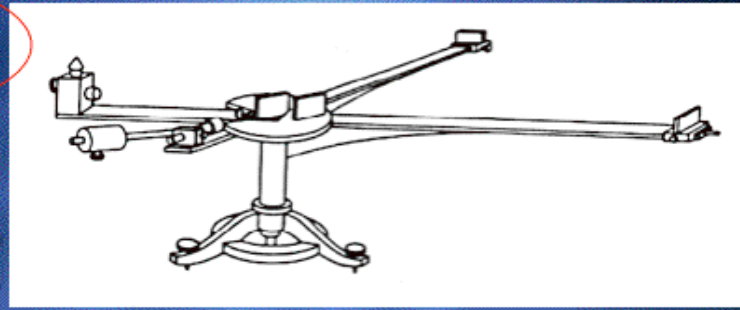
- ✦ Light beam is split, and recombined yielding interference fringes.
- ✦ Beams oriented at 90° on rotating platform.
- ✦ Ether-wind slows light-speed of beams across its path of motion.
- ✦ Rotation reveals ether speed & direction in fringe shifts



Michelson interferometer 1881

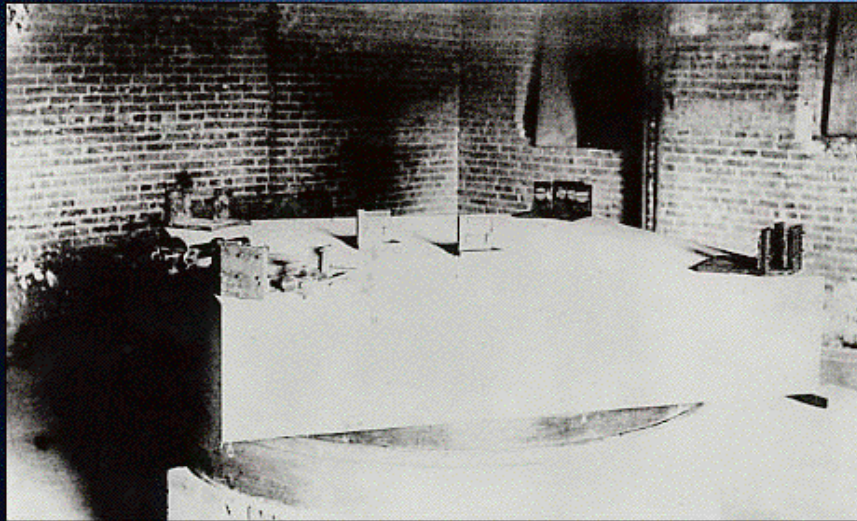
Michelson 1881 Experiment

- ⊕ "Assuming then that the ether is at rest..."
- ⊕ Arm-length of 1 m.
- ⊕ Discussion of experimental method, technique, difficulties.
- ⊕ Vibration, thermal expansion of arms.
- ⊕ Subsequent work with Edward Morley on light-speed through moving air & water. No result.

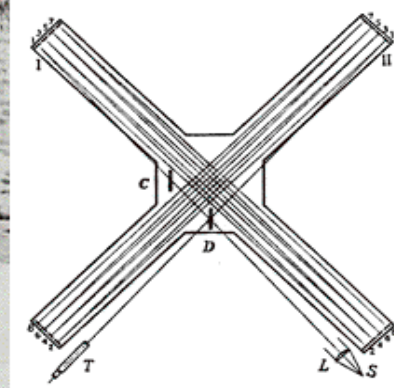


Michelson interferometer 1881

Michelson-Morley Interferometer



~2m "arms" stone base
32 m. RT light path



⊕ Operated over 4 days, 6 hours only, 36 rotations, with *wood cover* in *brick basement* of Case School, Cleveland, Ohio.

Michelson-Morley Interferometer Exp.

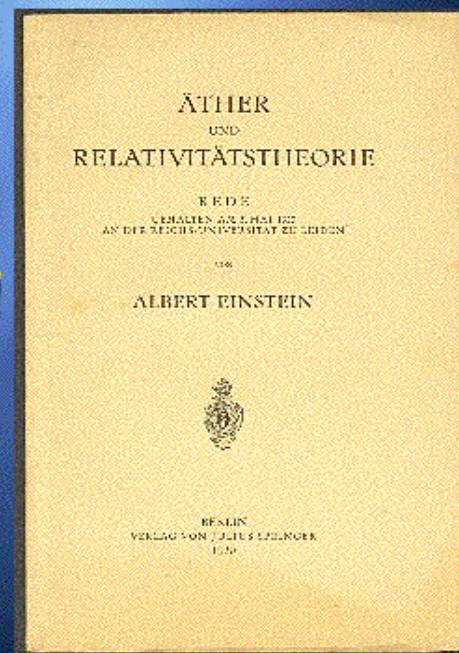
- ⊕ 6-9 July 1887, 6 hours of data collection, only 36 turns of interferometer. Round-trip light-path of 32 m.
- ⊕ Ether-drift of <10 kps measured. *"it is just possible that the resultant velocity at the time of the observations was small... The experiment will therefore be repeated at intervals of three months, and thus all uncertainty will be avoided."* "...at even moderate distances above the level of the sea, at the top of an isolated mountain peak, for instance, the relative motion might be perceptible in an apparatus like that used in these experiments...the cover should be of glass or removed." **These precautions and steps were only undertaken 1906-1933 by Dayton Miller.**
- ⊕ No mention by M.M. anywhere of "null" or "zero" effect.

M-M Exp. Conclusions:

- ⊕ Slight positive result $\sim 5\text{-}10$ kps
- ⊕ Widely misreported as “negative”, “zero” or “null”. This is not accurate!
- ⊕ Failed to detect only the *static ether (absolute space) of Newton*. $\sim 200\text{-}300$ kps
- ⊕ Left open the possibility for an Earth-entrained (dragged-ether) or dynamic ether-drift, where ether is affected by matter, slowed in motion.

Albert Einstein & the Ether

- ⊕ AE never fully rejected an ether, but was emphatic that it could not be a "ponderable media" and would have no motion, being only an abstraction. From this, the ether could not affect the speed of light, and would leave his relativity theory unchallenged.



Albert Einstein & the Ether

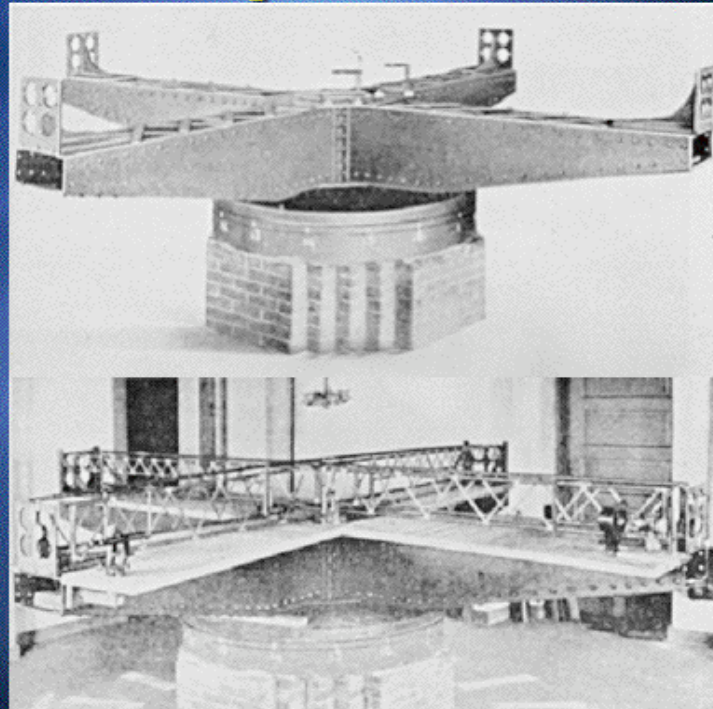
⊕ “Ether and the Theory of Relativity”

Lecture, 5 May 1920, University of Leyden:

“...the special theory of relativity does not compel us to deny ether. We may assume the existence of an ether; only we must give up ascribing a definite state of motion to it... According to the general theory of relativity space without ether is unthinkable; for in such space there not only would be no propagation of light, but also no possibility of existence for standards of space and time (measuring-rods and clocks), nor therefore any space-time intervals in the physical sense. But this ether may not be thought of as endowed with the quality characteristic of ponderable media, as consisting of parts which may be tracked through time. The idea of motion may not be applied to it.”

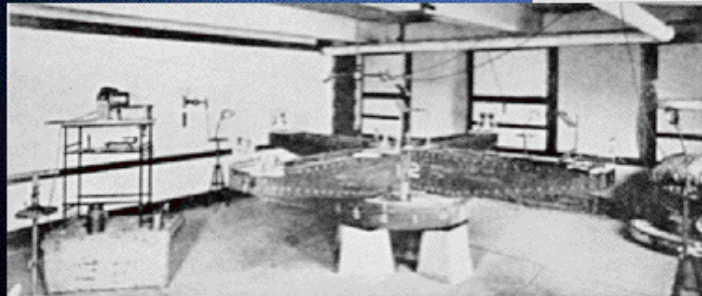
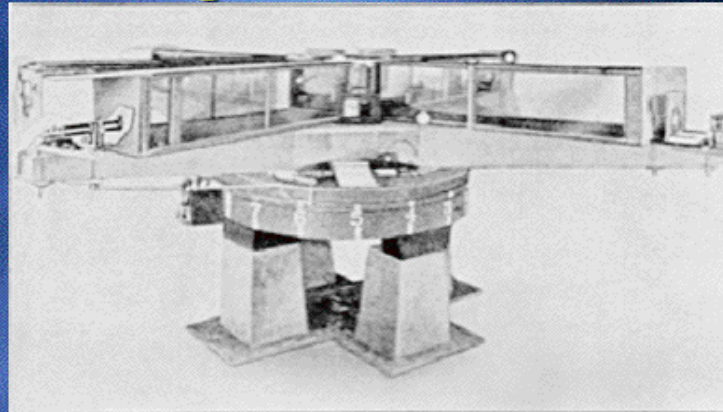
Morley-Miller Experiments

- ✦ 1903-1904, at Case Western
- ✦ 1904 test for Lorentz contraction
- ✦ 4.3 m arms, 64 m RT light-path.



Miller's Case Experiments

- ⊕ 1906-1930, Extensive controls & stress testing.
- ⊕ Non-magnetic interferometer
- ⊕ Other configurations
- ⊕ Preliminary Data Only!

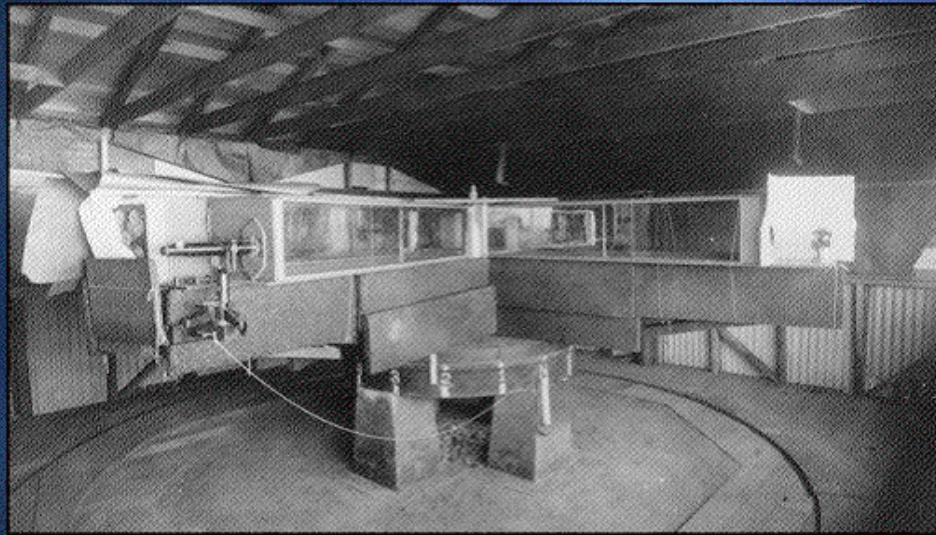


Dayton Miller's Interferometer - I

- ⊕ Largest and most sensitive ever constructed
- ⊕ Exposed light-path to ether-flow, no wood, metal or stone obstructions, only glass or paper
- ⊕ Over 200,000 observations, more than 20 years work (M-M 6 days)
- ⊕ 12,000+ turns of the interferometer (M-M 36 turns)
- ⊕ Apparatus eventually taken up to high altitudes, to overcome Earth-entrainment of ether-drift.

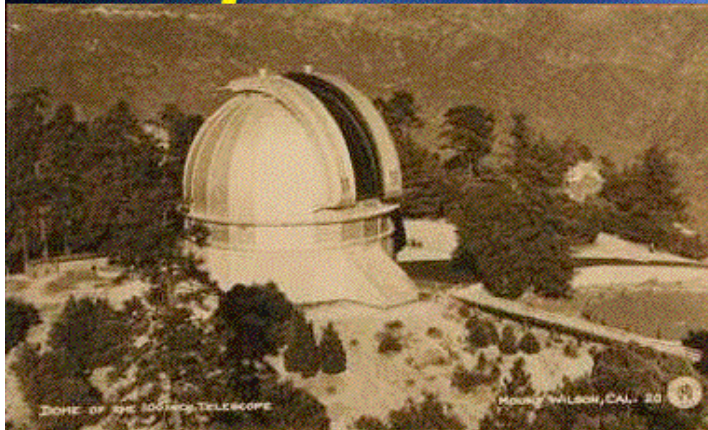


Miller's Interferometer - II

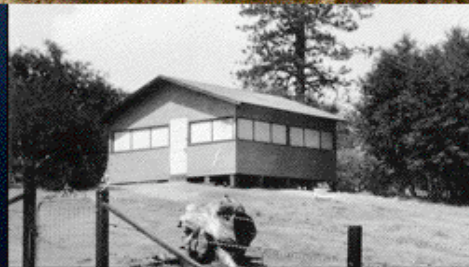


- ✦ Metal cross-arms covered with cork during operations, light path enclosed in glass. Hut windows at same level as light-path.

Miller's Mt. Wilson Experiments - I (1925-26)

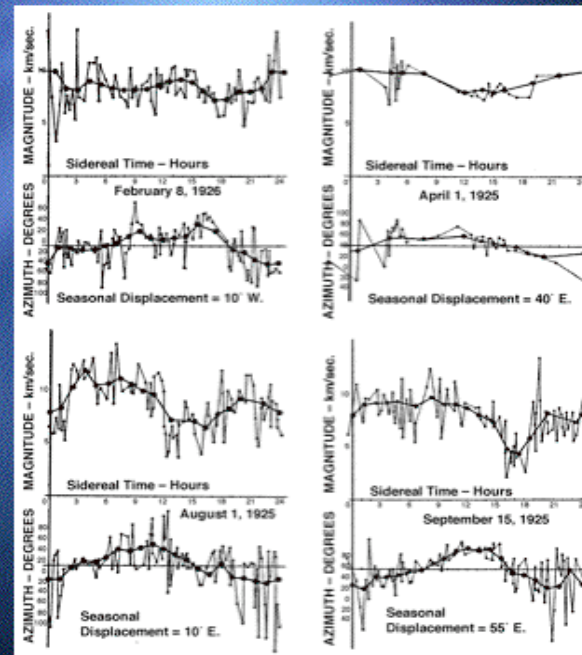
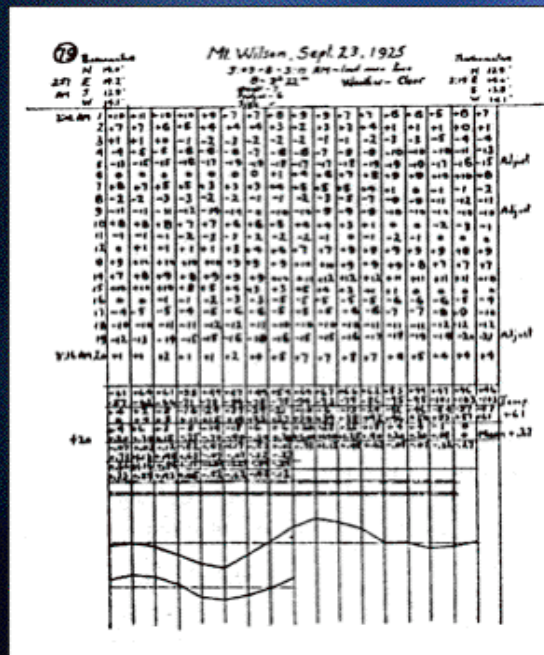


1830 m - 6000' altitude



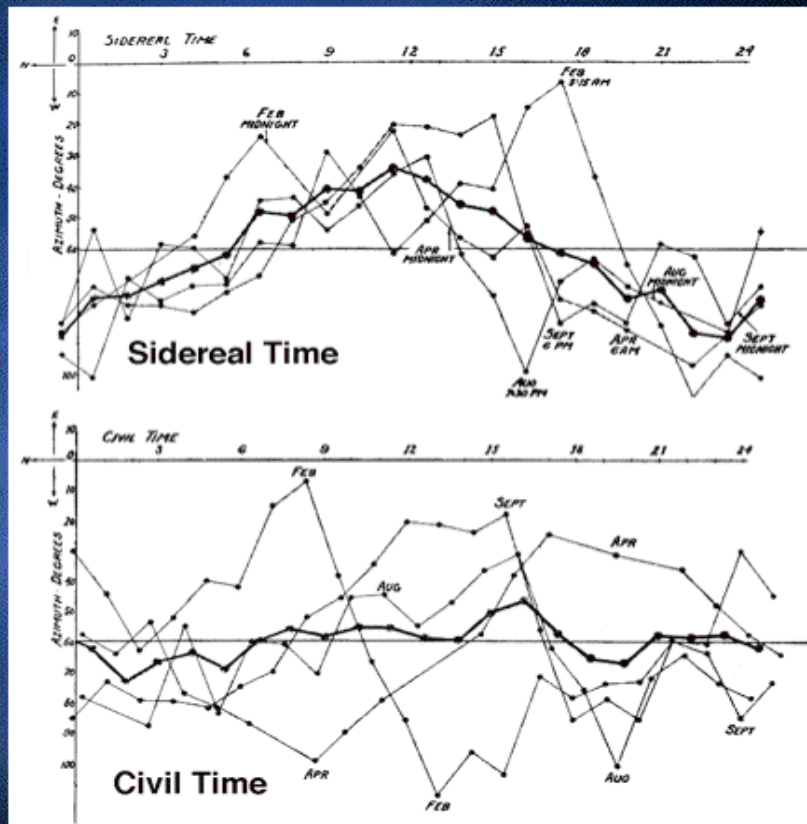
Miller's Mt. Wilson Expts - II

Four seasonal epochs:
1925: Apr., Aug., Sept.
1926: Feb.



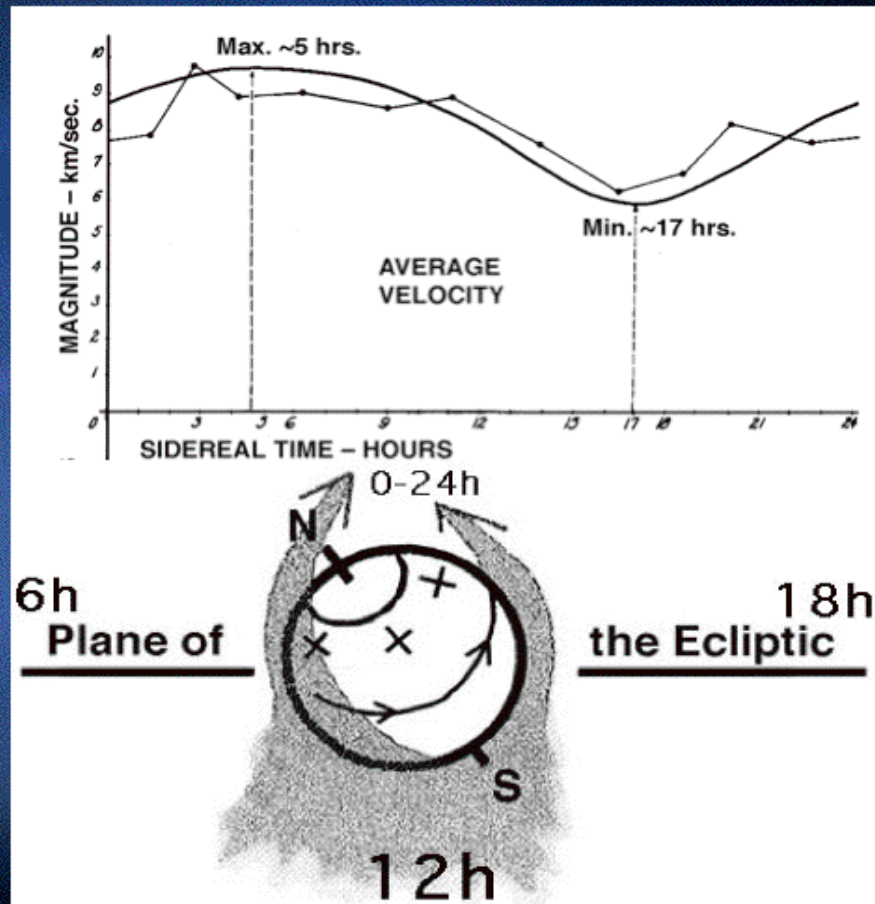
Miller, Mt. Wilson - III

- ✦ Data graphed by Civil Time = *insignificant*
- ✦ Same data by Sidereal Time = *significant*
- ✦ **A True Cosmical Component!**



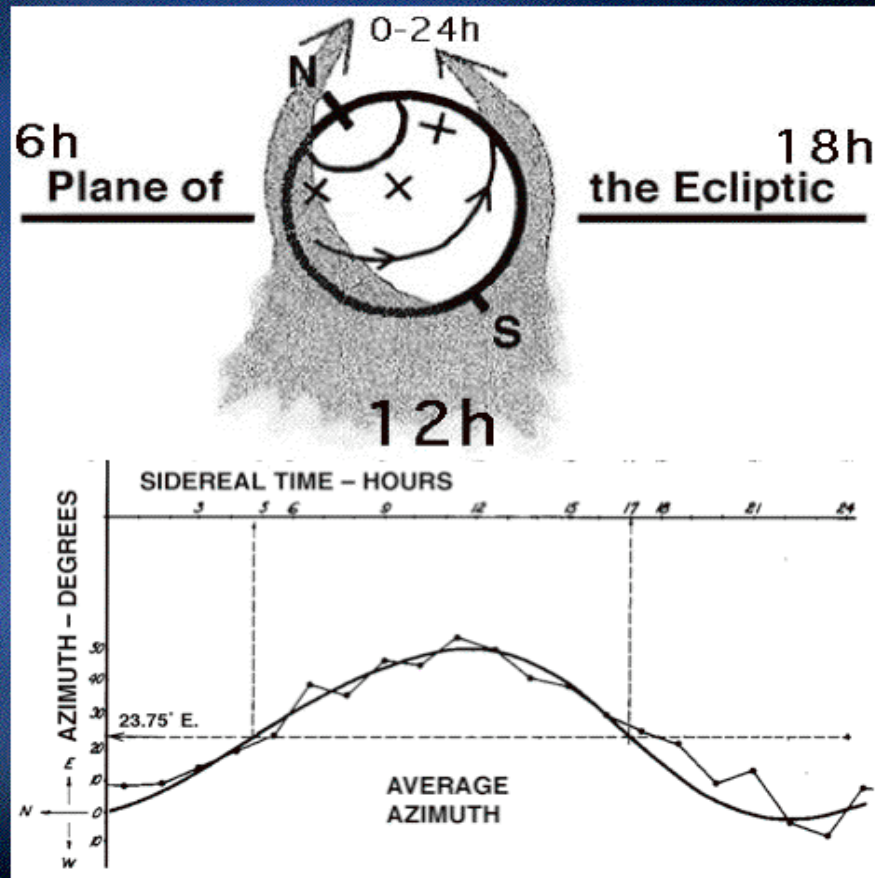
Miller, Mt. Wilson - IV

- ⊕ Sidereal Time Velocity Shift over 24 hours.
- ⊕ V.max @ 5h.
Ether-flow max.
- ⊕ V.min @ 18h.
Ether-flow min.
blocked by Earth
- ⊕ Ether must have Slight Mass!



Miller, Mt. Wilson V

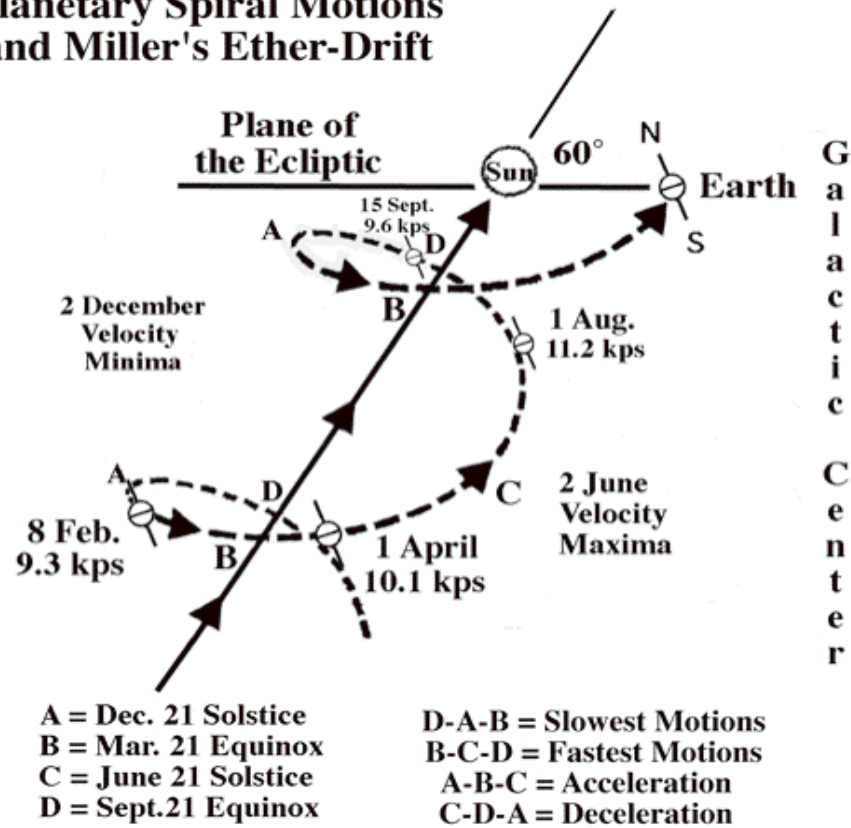
- ⊕ Sidereal Time
Azimuth Shift over
24 hrs.
- ⊕ 23.5° East
displacement.
- ⊕ $6h \sim 23.5^\circ$ NE
- ⊕ $12h \sim 48^\circ$ NE
- ⊕ $18h \sim 23.5^\circ$ NE
- ⊕ $0/24h \sim 0^\circ$ N
- ⊕ **Ether-flow has
a West→East
component**



Miller, Mt. Wilson VI

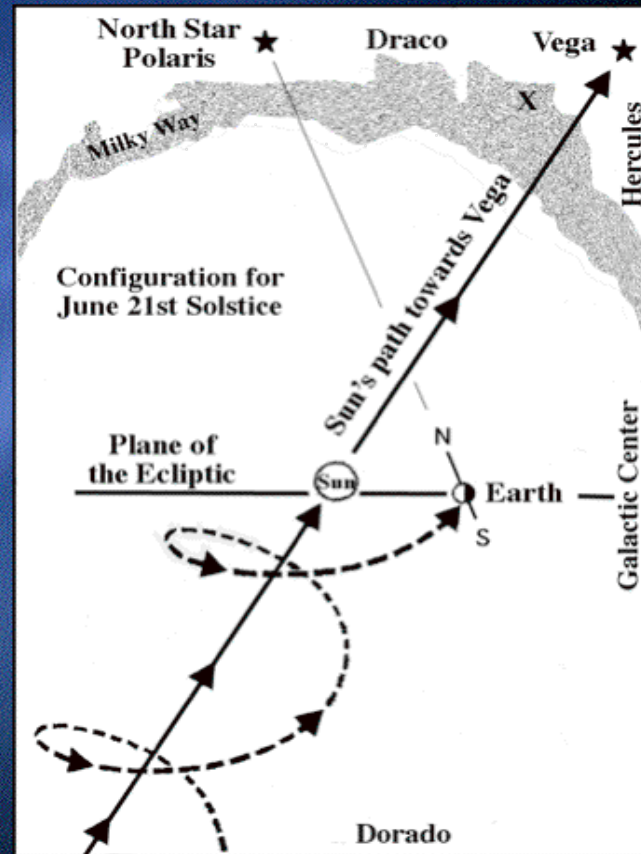
- ⊕ Seasonal Velocity Shift
- ⊕ Velocity in June would be higher
- ⊕ Velocity in Dec., lower

Planetary Spiral Motions and Miller's Ether-Drift



Miller's Conclusions

- ⊕ Velocity of ~ 10 kps average as determined at Earth surface, reduced from presumed ~ 300 kps ether-drift in open space.
- ⊕ In 1929, Miller selected Draco-Hercules, near Vega in N. Hem as locus. By 1933, he selected Dorado in S. Hem. (E-D mmts. Can select only the axis of drift, not the direction.)



Einstein-Miller Dispute

✦ GOES TO DISPROVE EINSTEIN THEORY

Cleveland Plain Dealer newspaper, 27 Jan. 1926

Case Scientist Will Conduct Further Studies in Ether Drift. Einstein Discounts Experiments. Speaking before scientists at the University of Berlin, Einstein said the ether drift experiments at Cleveland showed zero results... temperature differences have provided a source of error. "The trouble with Prof. Einstein is that he knows nothing about my results." Dr. Miller said. "He has been saying for thirty years that the interferometer experiments in Cleveland showed negative results. We never said they gave negative results, and they did not in fact give negative results. He ought to give me credit for knowing that temperature differences would affect the results. He wrote to me in November suggesting this. I am not so simple as to make no allowance for temperature."

Albert Einstein & the Ether

✦ *"I believe that I have really found the relationship between gravitation and electricity, assuming that the Miller experiments are based on a fundamental error. Otherwise, the whole relativity theory collapses like a house of cards."*

-- Albert Einstein, in a letter to Robert Millikan, June 1921 (in Clark 1971, p.328)

Albert Einstein & the Ether

⊕ *"My opinion about Miller's experiments is the following. ... Should the positive result be confirmed, then the special theory of relativity and with it the general theory of relativity, in its current form, would be invalid. Experimentum summus iudex. Only the equivalence of inertia and gravitation would remain, however, they would have to lead to a significantly different theory."*

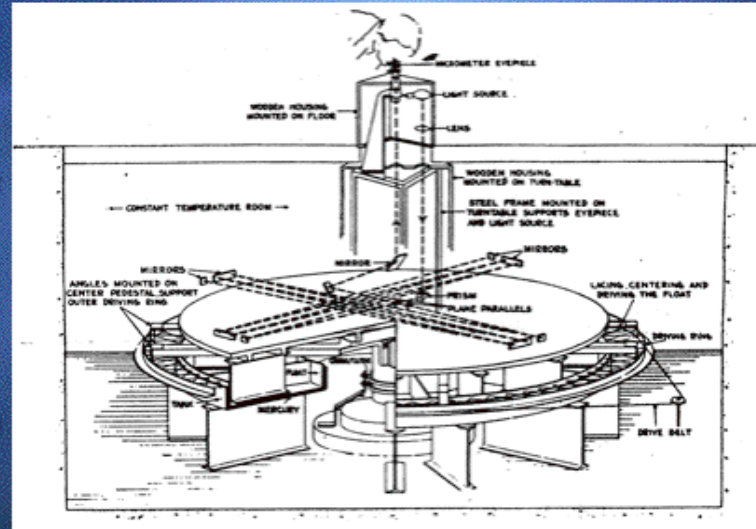
-- Albert Einstein, in a letter to Edwin E. Slosson, July 1925

Confirmation of Miller Result

- ⊕ Michelson-Pease-Pearson, Mt. Wilson 1928.
- ⊕ Kennedy-Thorndike, 1932.
- ⊕ Roland DeWitte, c.1980s??
- ⊕ Maurice Allais re-analysis, c.2000
- ⊕ Yuri Galaev, 2000-2001.
- ⊕ Rita Bernabei, Seasonal Variations in "Dark Matter Wind", 2000+
- ⊕ Similar phenomenon: W.Reich, G.Piccardi

Michelson-Pease-Pearson Mt. Wilson Expt. 1928

- ✦ 52m light-path
- ✦ Inside metal Mt. Wilson Hooker Observ. Dome.
- ✦ Positive results of ~20 kps with Sidereal Day variation reported as "negative" due to static-ether bias, expecting ~300 kps



Kennedy-Thorndike Exp. 1932

- ⊕ Performed inside heavy metal shields
- ⊕ Obtained positive results, 24 kps, but like Michelson-Pease-Pearson, this was ignored as they only looked for high-velocity static-ether results ~300 kps.
- ⊕ *"In view of relative velocities amounting to thousands of kps known to exist among the nebulae, this can scarcely be regarded as other than a clear null result."*
- ⊕ No details on altitude, seasons, sidereal hour variations, etc.

Roland DeWitte's Experiment

- ⊕ Compared the phases of two atomic clocks, 1.5 km apart, via an underground coaxial cable laid ~N-S axis, using an RF signal at 5 Mhz.
- ⊕ Sidereal phase-shift in signal velocity validating Miller:

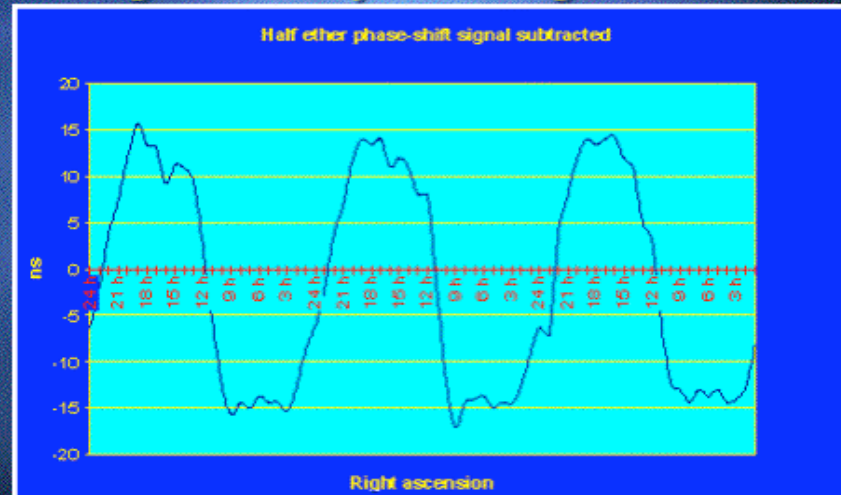
Faster @ RA.6h

Parallel axis

slower @ RA.18h

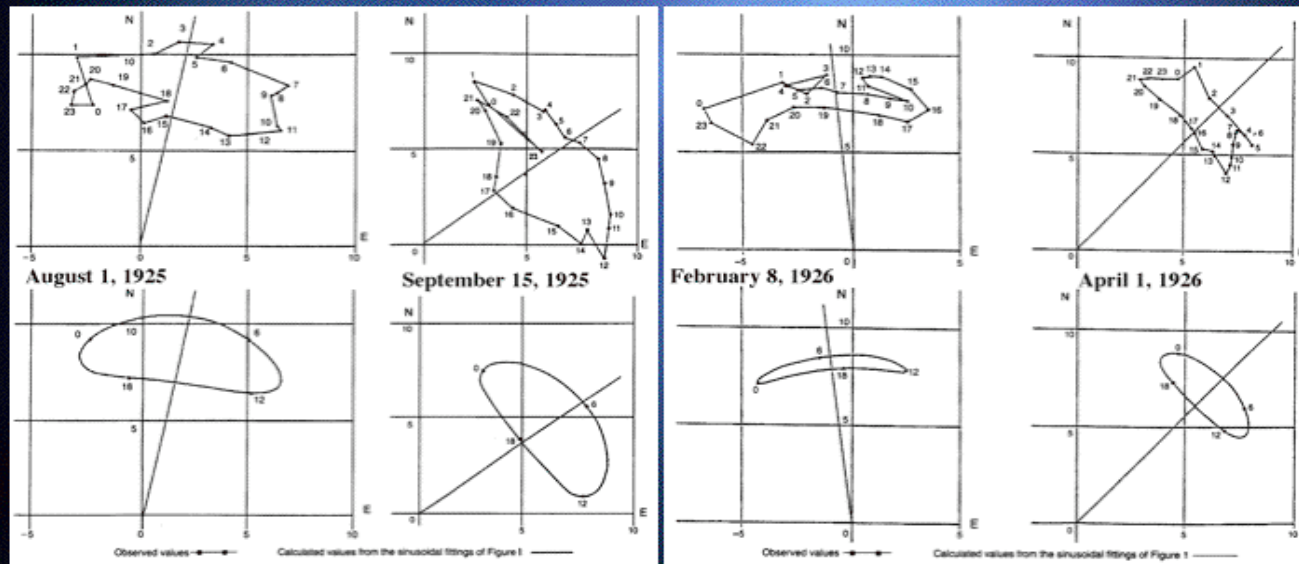
Perpendicular axis

- ⊕ Confirmed by
Reginald Cahill
Flinders Univ.??



Maurice Allais Reanalysis of Miller Mt. Wilson Data

⊕ Found hidden structure in Miller data



Yuri Galaev's Expts. I

⊕ Inst. Radiophysics & Electronics, Ukraine.



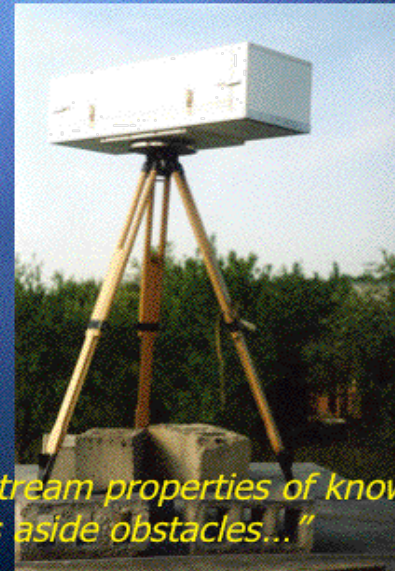
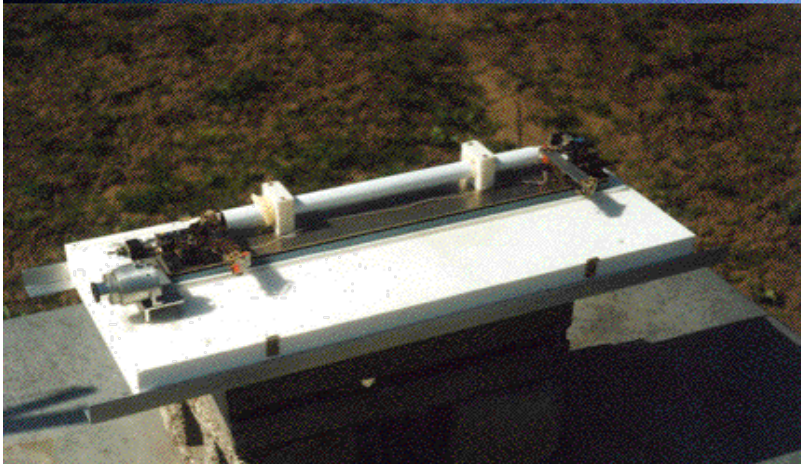
⊕ 1998-99:
Radiowaves @
~37 GHz

⊕ 2001-02:
Optical
Interferom.

⊕ Confirmed
Miller "*down
to the details*"

Yuri Galaev's Optics Expts. II

- ⊕ Optical Laser Interferometer ($\lambda = 6.5 \times 10^{-7}$) using the Principle of Ether-Flow Obstruction & Kinematic Viscosity. One arm of light-path inside metal pipe $\sim 0.5 \times 0.02$ m.



"...ether stream properties are close to the stream properties of known gases at their interaction with solids, to pass aside obstacles..."

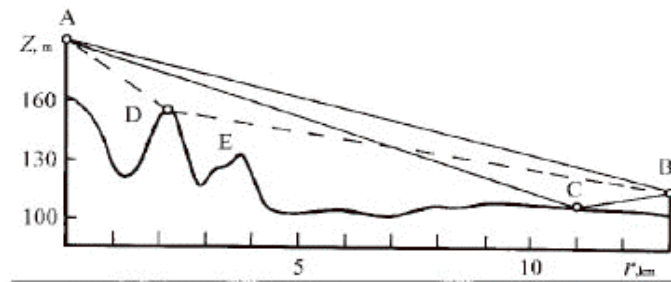


Figure 2: The experimental radiolink profile

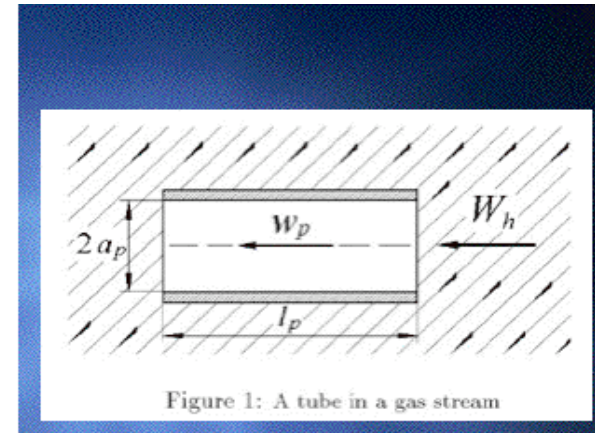


Figure 1: A tube in a gas stream

Yuri Galaev's Expts. III

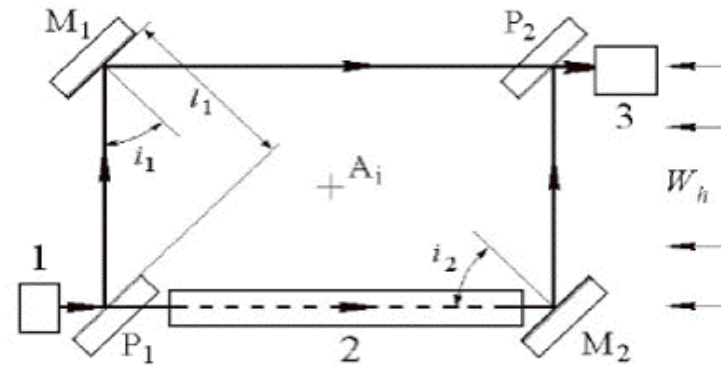


Figure 3: The schema of an optical interferometer

Yuri Galaev's Expts. IV

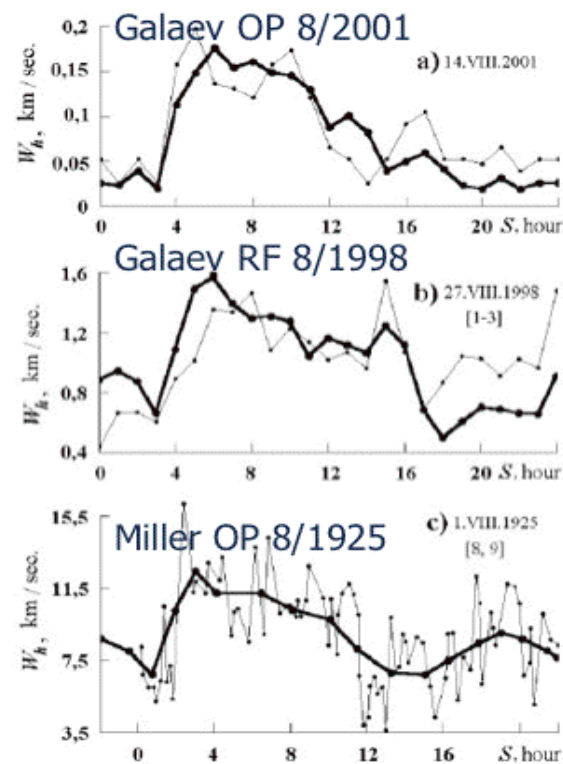
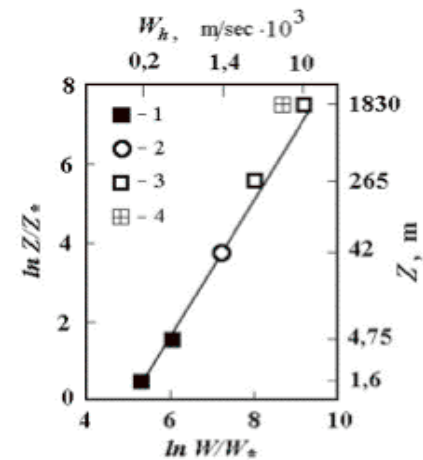


Figure 8: Variation of ether drift velocity within a day in August epoch



3-Miller (optics, Mount Wilson) 1905, 1921-1926

4-Michelson (optics, Mount Wilson) 1929

2-Galaev (radio waves, Kharkov) 1998-1999

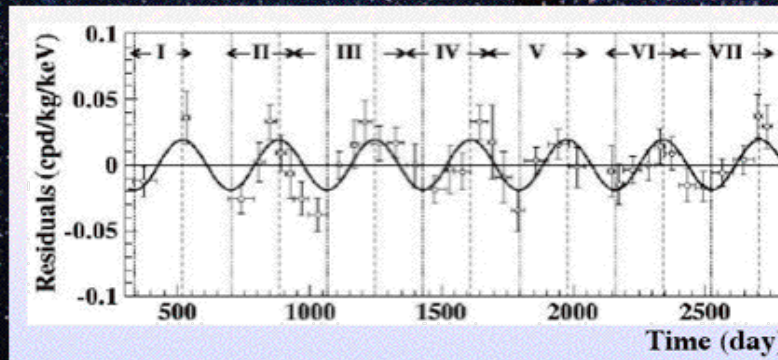
1-Galaev (optics, Kharkov) 2001

Rita Bernabei:

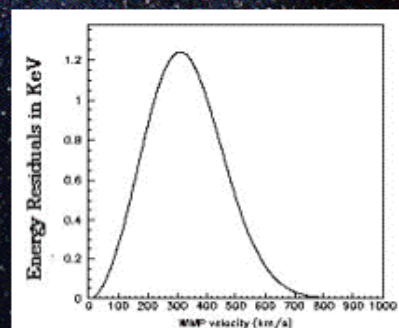
DAMA Project

Gran Sasso, Italy

- ✦ Seasonal Variations in "Dark Matter Wind"
- ✦ WIMP residuals "cold dark matter particles from primordial universe" at 2-6 keV, 7 years data
- ✦ Peak velocities in Spring-Summer, ~ 200 -300 kps



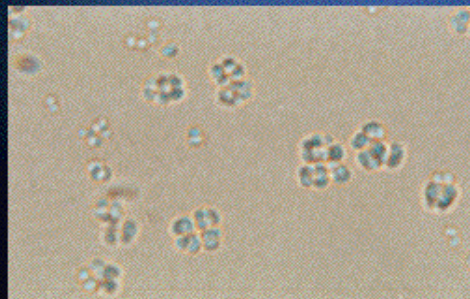
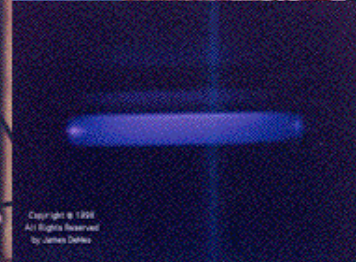
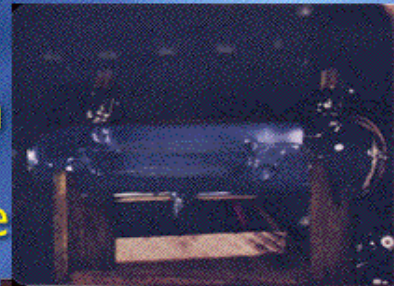
Graphs from Bernabei, et al. <http://people.roma2.infn.it/~dama/>



WIMP Maxwellian velocity distribution ($v_0=220$ km/s)

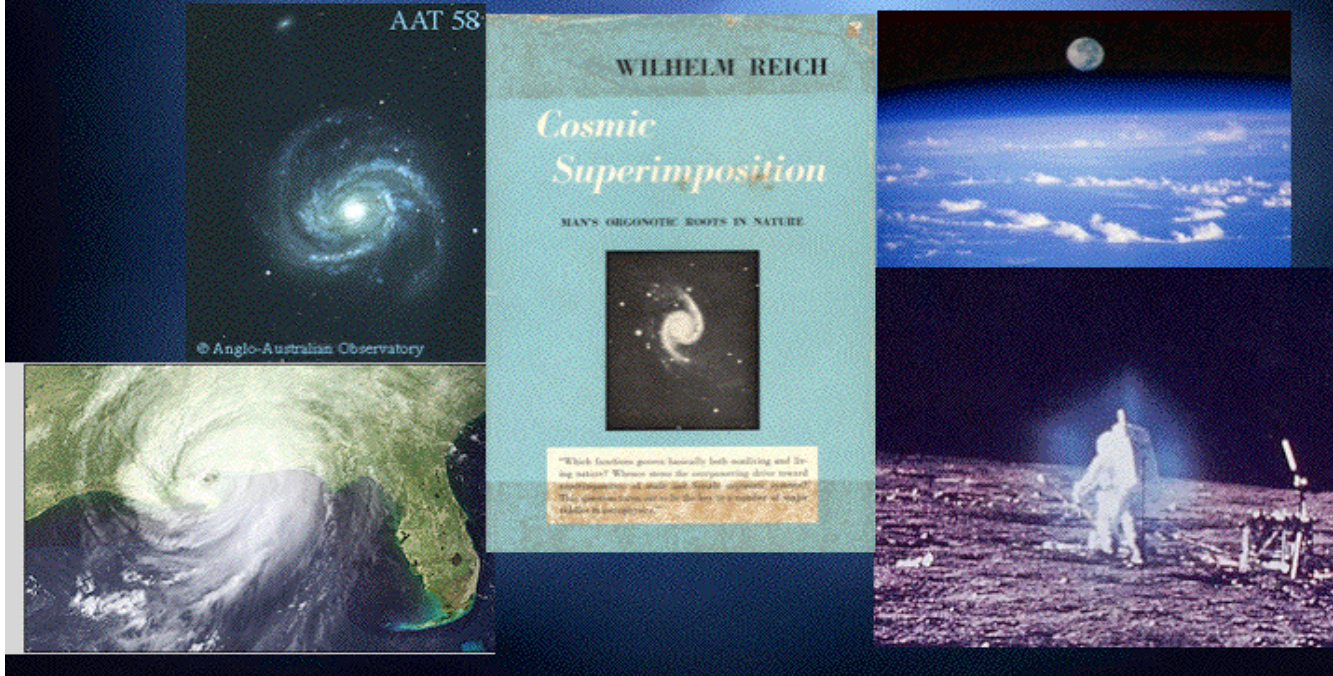
Wilhelm Reich's Cosmic Superimposition - I

- ✦ Discovery of a blue-glowing bio-cosmic energy (*orgone*) from microbes, people, plants, also mass-free in the atmosphere



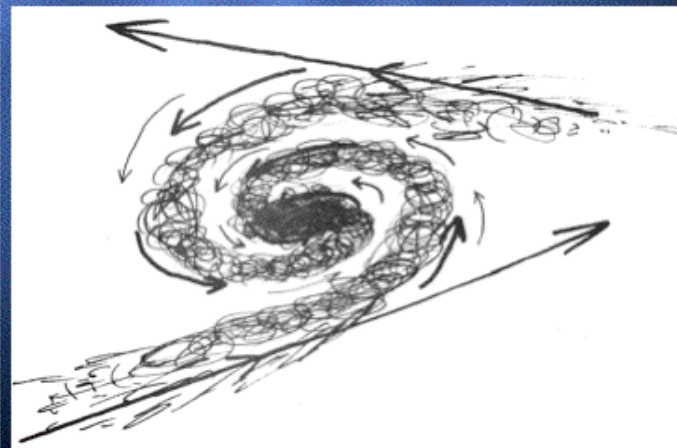
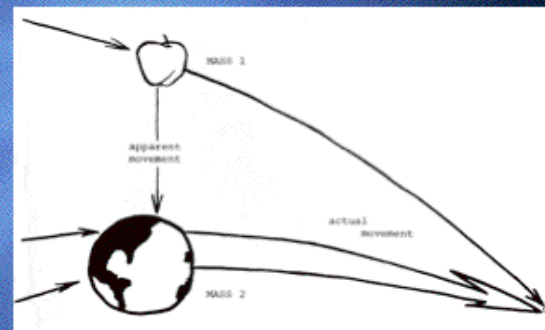
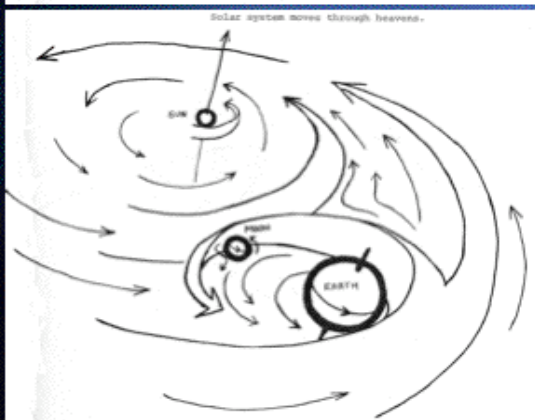
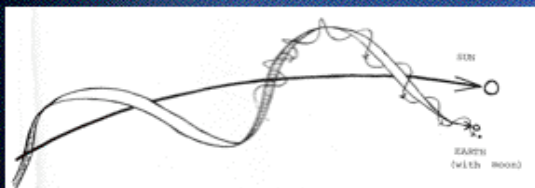
Reich's Cosmic Superimposition - II

Metal shields capture phenomenon, altitude important,
Cosmic geometry of theory agrees with Miller result.



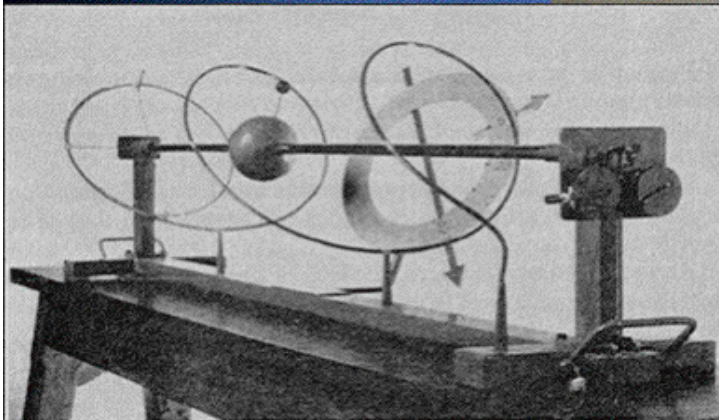
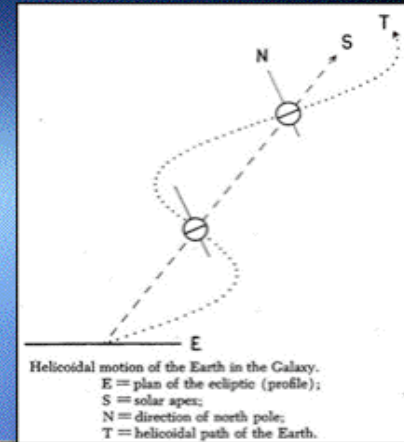
Reich's Theory - III

Grand Unifying Theory of Life, Weather, Cosmos



Giorgio Piccardi's Experiments

- ⊕ Physico-chemical Tests inside/ under metal shields show cosmical results different from outside shields. Altitude increases effect.



From Outside of Milky Way Galaxy...

- ✦ Sagittarius Dwarf Tidal Stream (K. Freese et al. astro-ph/0309279)
- ✦ Spiral polarization of galactic light (Nodlund & Ralston)
- ✦ Cosmic Microwave 3° K Anisotropy (a real thermal difference?)

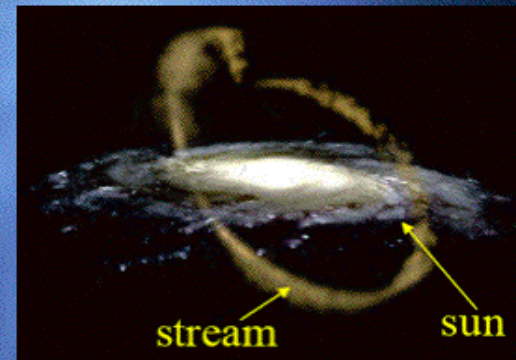
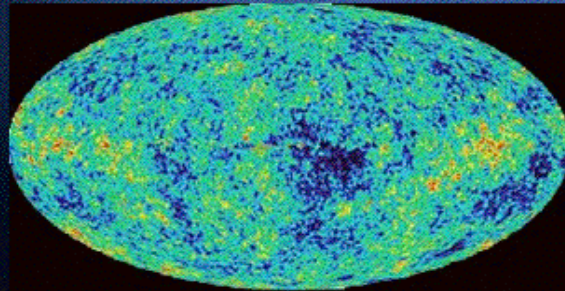
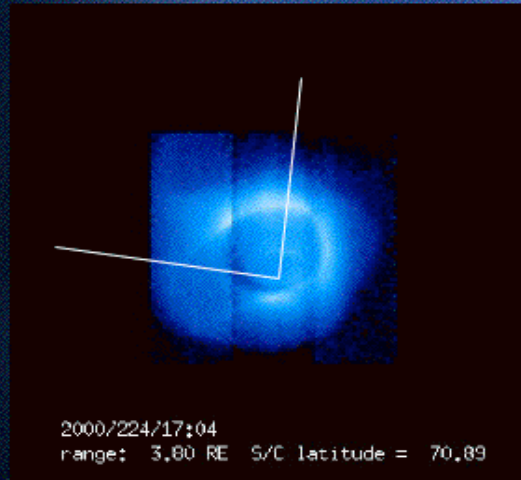
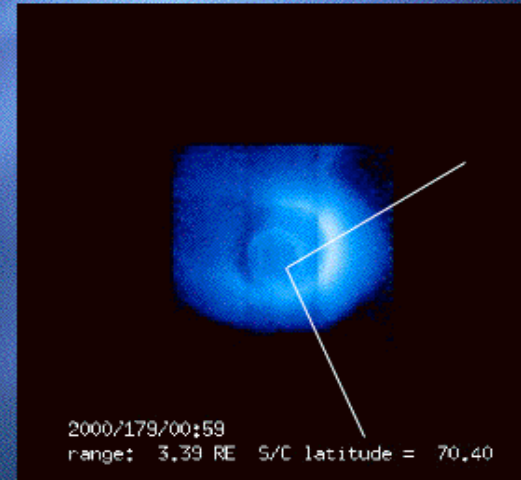


IMAGE Satellite

***Suggests Dynamic Earth Field Moves sl.
faster than Earth rotation ~150kph W-->E***



**~90 deg/<5.5 hrs
360 deg in 22 hrs -> 9%
17:04-22:30 = 5:26**



**~100 deg/<6 hrs
400 deg in 24 hrs -> 9.5%
00:59-06:46 = 5:45**

Critics & Bad Experiments

- ⊕ Original M-M experiment in basement of stone building, wood cover over light-path
- ⊕ Joos experiment in Austria: gigantic apparatus inside thick metal structure.
- ⊕ Shankland, et al, politically-motivated critique
- ⊕ Einstein's continued rejectionism.
- ⊕ Swenson: Ether-drift research finally compared with "*search for perpetual motion*".

George Joos Interferometer

- ✦ 1930, Jena, Austria.
- ✦ Miller: *"If the question of an entrained ether is involved in the investigation, it would seem that such massive and opaque shielding is not justifiable. The experiment is designed to detect a very minute effect on the velocity of light, to be impressed upon the light through the ether itself, and it would seem to be essential that there should be the least possible obstruction between the free ether and the light path in the interferometer."* (Miller 1933, p.240)



The Shankland, et al Critique of Miller, 1955

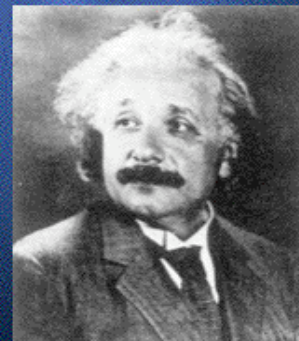
- ⊕ Reviewed Miller's data without finding systematic errors or flaws by which the patterns could be explained. Cherry-Picked a few data sheets for criticisms. Mixed Miller's control expts. with Mt. Wilson experiments.
- ⊕ Claimed Miller's result was the product of thermal artifacts in data, but did not explain how this could be. An "arm-chair analysis" & "Royal Proclamation", blessed by AE.
- ⊕ Originally Miller's student, later worked closely with AE.



Albert Einstein & the Ether

⊕ *"You imagine that I look back on my life's work with calm satisfaction. But from nearby it looks quite different. There is not a single concept of which I am convinced that it will stand firm, and I feel uncertain whether I am in general on the right track."*

-- Albert Einstein, on his 70th birthday, in a letter to Maurice Solovine, 28 March 1949 (in B. Hoffman *Albert Einstein: Creator and Rebel* 1972, p.328)





James DeMeo, Ph.D.
Orgone Biophysical
Research Lab
Ashland, Oregon, USA
www.jamesdemeo.org
demeo@mind.net

