A Tribute to John R. Hickey

A Partial Overview of His Life
And His Pioneering Work to Advance Solar Measurements

Tom Stoffel
September 2016

John R. Hickey

June 14, 1936 – August 9, 2016

"What matters is how we live and love
And how we *spend our dash."*

What People Said About John

- He was truly a man of **service**. Rev Marcel Tailon
- Always a Narragansett Guy and **a book of knowledge** for the younger generation. Jim Durkin, Councilman
- **The perfect candidate** (for Town Council). Gene Wills, Democratic Town Committee
- He didn't talk about himself and just wanted to **keep his head down and help people**. Jonathan Hickey, son
- He had **integrity** beyond most people**.** Very, very **honest.** Quintessential **scholar and researcher.** John was a **perfectionist.** That will always be his legacy**: *Do it the right way***. Norman Campbell, URI professor
- John was truly a **professional and tenacious scientist**. Gene Zerlaut, friend and colleague
- **He lived his faith** in every aspect of his life. Monsignor John Halloran

Biographical Highlights

- Loving husband to Hope Hickey for 57 years
- Doting father to Jonathan, Kate and Ryan and grandfather to Connor, Cameron, Ruya and Devrim
- Devout communicant and active member of St. Thomas More parish in Narragansett
- Coach & President, Narragansett Little League for 37 years
- Charter Member, Narragansett Lions Club (1969)
- Councilman, Narragansett, Rhode Island for six terms
- State Representative, Rhode Island for three terms

Biographical Highlights$_2$

- Major, U.S. Army Reserve for 23 years
- Solar physicist and inventor, The Eppley Laboratory, Inc. for 55 years
- Recipient, Charles Greeley Abbot Award, 1994 (American Solar Energy Society)
- Teacher, Mentor, and Servant Leader to young professionals
- Critical Thinker and Valued Colleague to those working on solar and atmospheric radiation measurements

How He Started His Career

His Graduate Advisor for his Master's at the University of Rhode Island, suggested he contact ***The Eppley Foundation*** for Research about a possible internship.

Before completing his MS-Physics in 1963, he joined The Eppley Laboratory, Inc. in 1961 as a solar physicist.

Solar Measurements Issues of His Day

- **Common** Measurement Scale
- Reliable **observations** of the "Solar Constant"
  (now, *Total Solar Irradiance*)
- Accurate and Reliable **Radiometer Designs** for continuous outdoor measurements
- **Standards** for Solar and Infrared Radiometry

3rd annual course by the Eppley Laboratory on
Fundamental Radiometry for Experimental Scientists
31 July – 5 August 1967

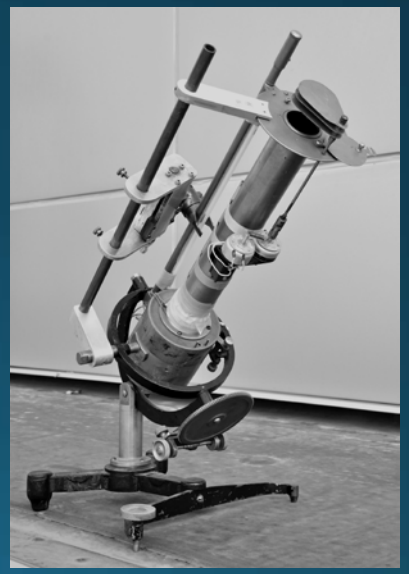
Solar Measurements Issues of His Day

- Measurement Scales (1973)*

1905 Ångström scale based on electric-compensation pyrheliometer

1913 Smithsonian scale based on Abbot silver-disk pyrheliometer

1956 International Pyrheliometric Scale 1956:
IPS 1956 = Ångström x 1.015
IPS 1956 = Smithsonian x 0.980



*J. R. Latimer (1973) On the Ångström and Smithsonian absolute pyrheliometric scales and the International Pyrheliometric Scale 1956. Tellus, Vol. 25, No. 6 , Pages 586-592.

Solar Measurements Issues of His Day

- Reliable observations of the “Solar Constant”

1960-61: Ama Dablam
Himalaya 22,494 ft

International Geophysical Year 1957-58

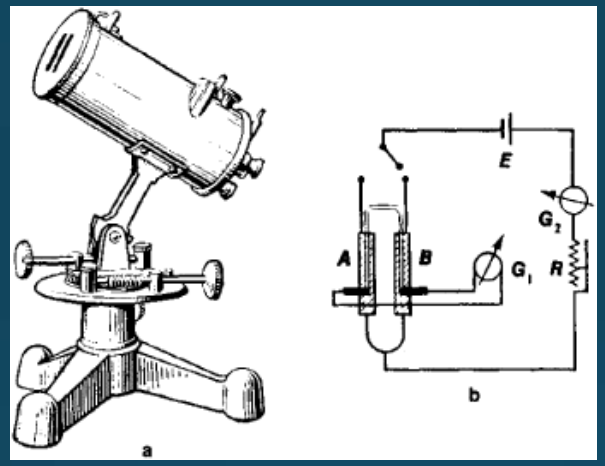
Sounding Rockets

Measurements by Charles Greeley Abbot from 1902 – 1957: 1.89 to 2.22 cal/min/sq cm (1,318 to 1,548 W/m^2)
1954: SC = 2.00 cal/min/sq cm ±2%

Solar Measurements Issues of His Day

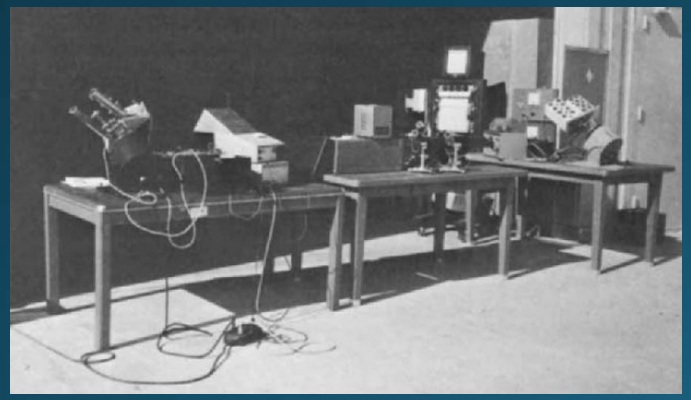
- Accurate and Reliable Radiometers

Charles Greeley Abbot
With Silver Disk Pyrheliometer (ca 1930)

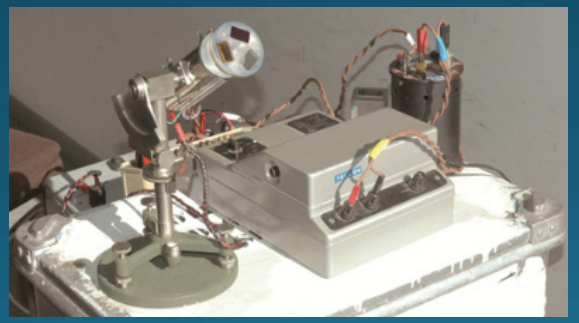


Ångström Pyreliometer (ca 1900)

Eppley Model 50 (1951-1975)



JPL Table Mountain 1967

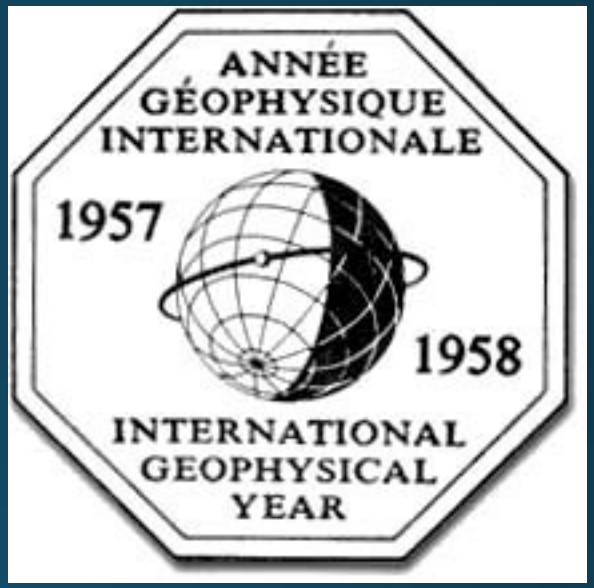


Ångström Pyreliometer (ca 1960)

Eppley Model NIP (1957 – 2015)

Solar Measurements Issues of His Day

- Standards for Solar and Infrared Radiometry



International Geophysical Year (IGY) 1957-58

World Meteorological Organization
Commission for Instruments and Methods of Observations (CIMO)

John's Key Contributions

- Reliable observations of the "Solar Constant"

NASA/USAF X-15

NIMBUS 6

Earth Radiation Budget Satellite (ERBS)

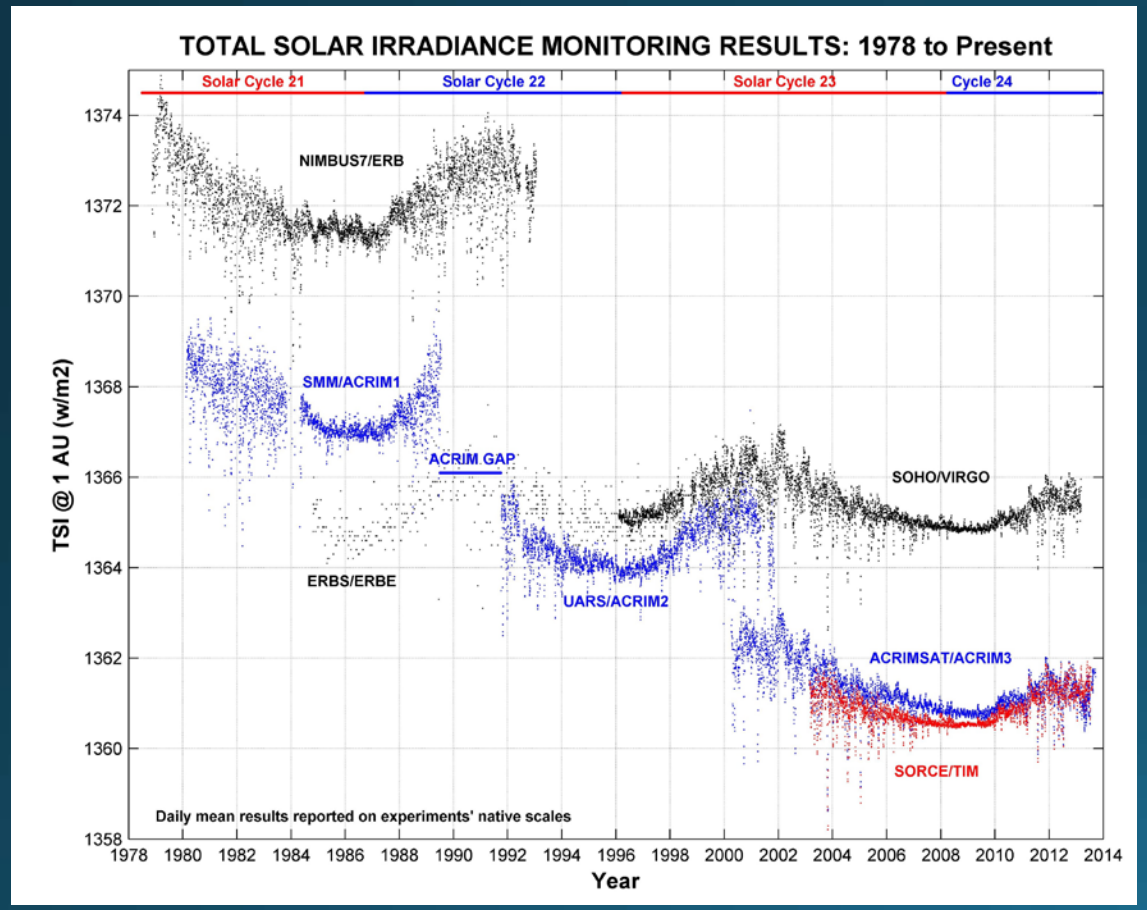
USAF RB-57F

NIMBUS 7 ERB

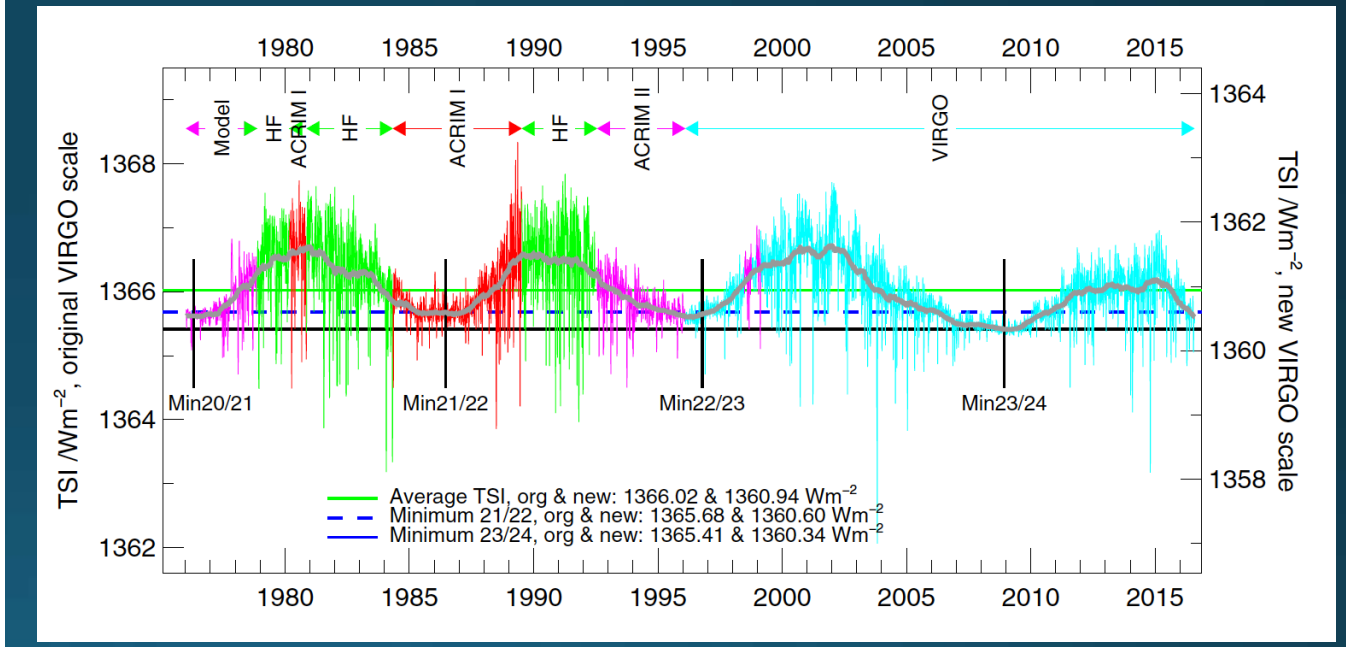
Long Duration Exposure Facility (LDEF)

John's Key Contributions

- Reliable observations of the "Solar Constant"



Richard C. Willson (ACRIM)



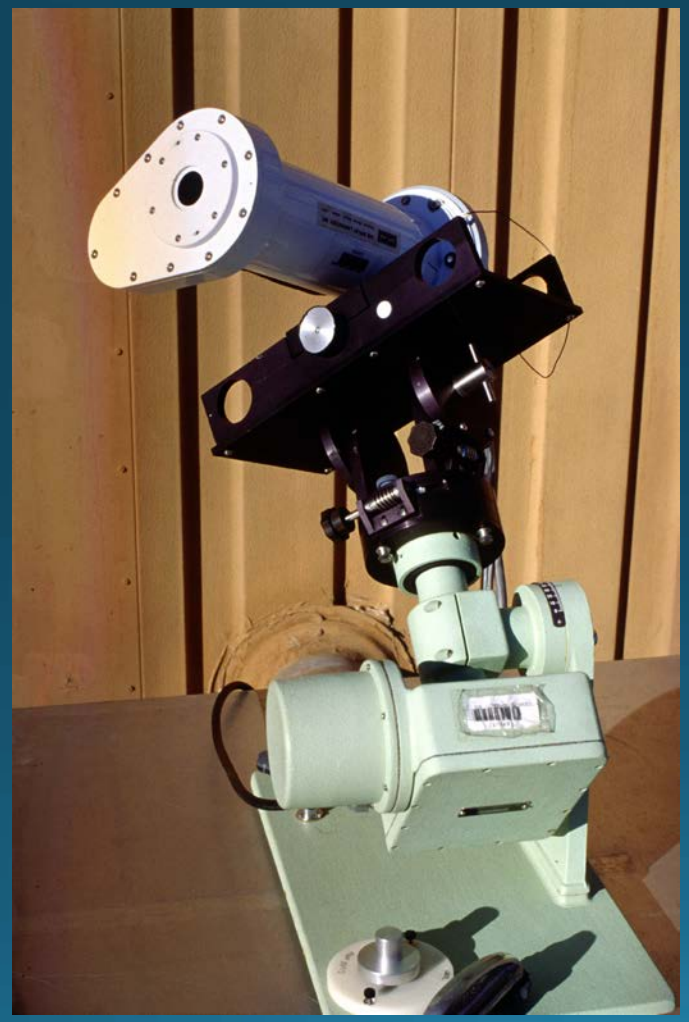
Proxy Model Composite: Claus Fröhlich (PMOD/WRC)

John's Key Contributions

- Accurate and Reliable Radiometers

Automatic Hickey-Frieden
Absolute
Cavity
Radiometer

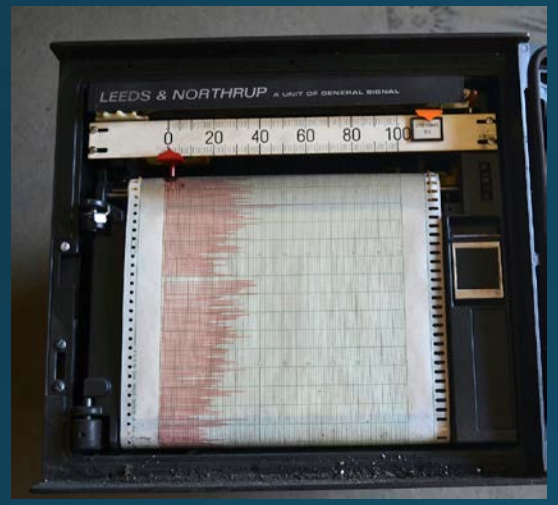
Eppley Model AHF



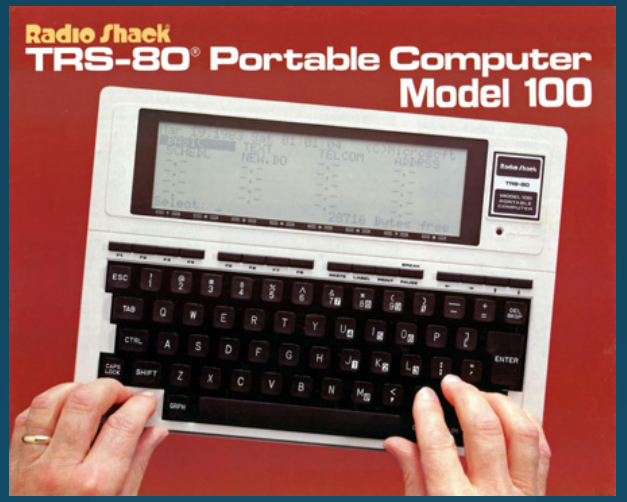
John's Key Contributions

From ANALOG to DIGITAL World of Measurements

1900



1960



1980

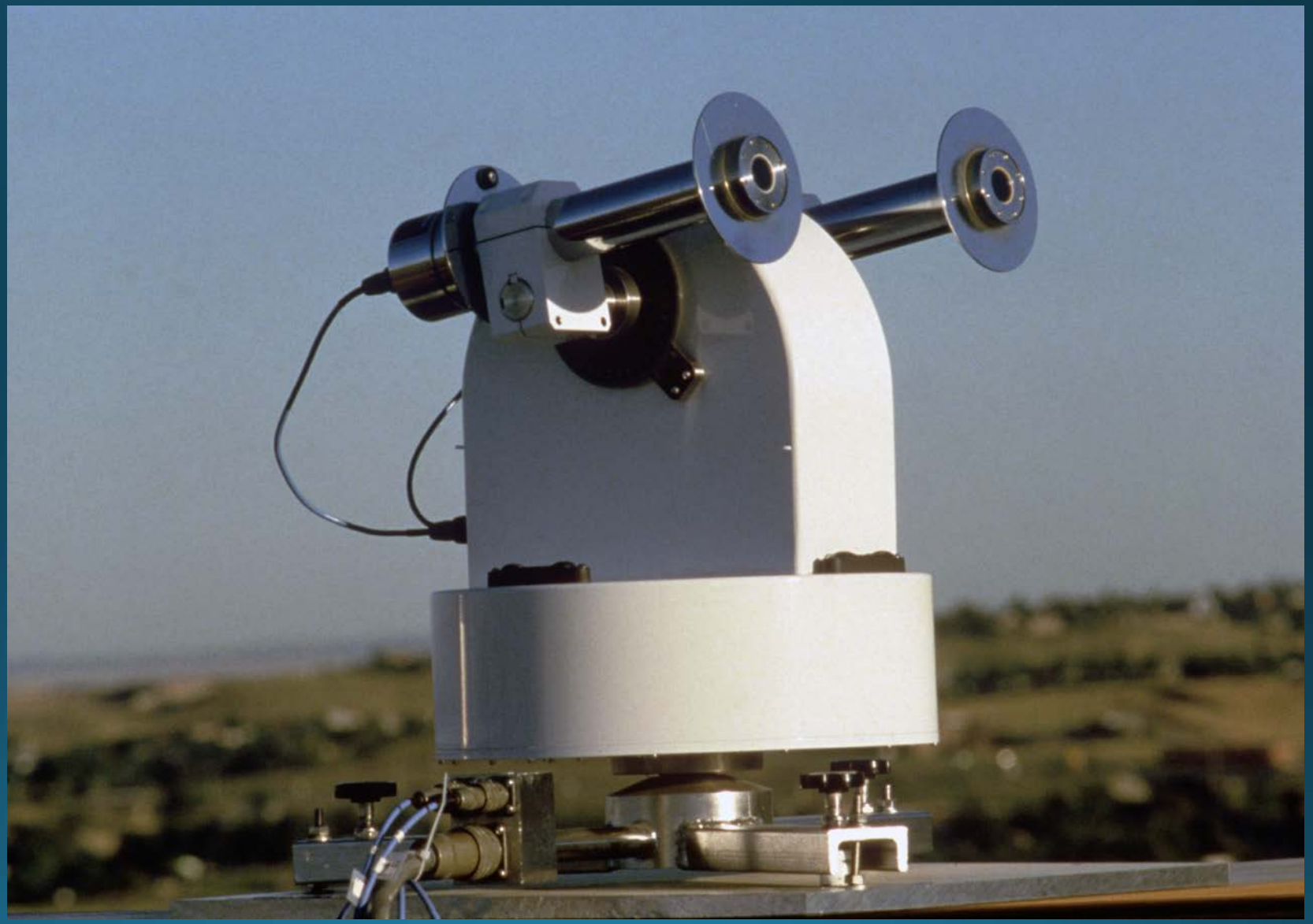
2016

John's Key Contributions

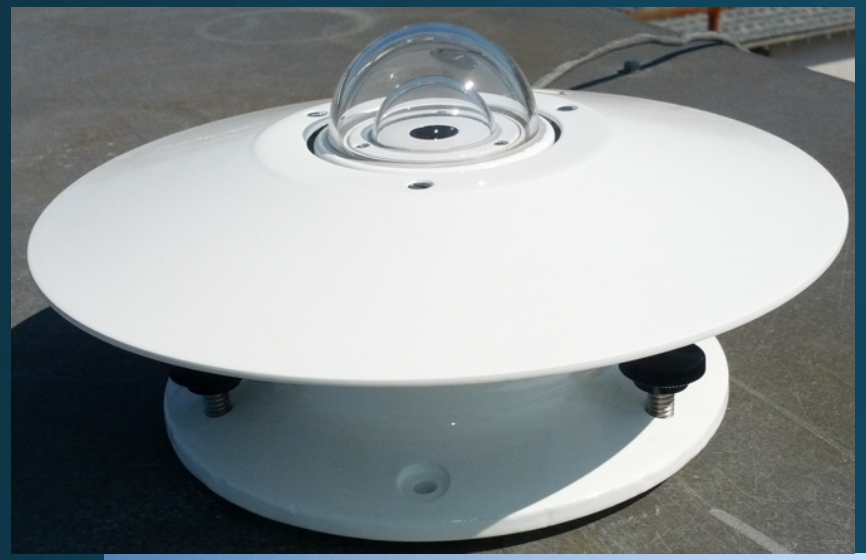
Solar Tracker for
New NOAA Network (ca 1980)

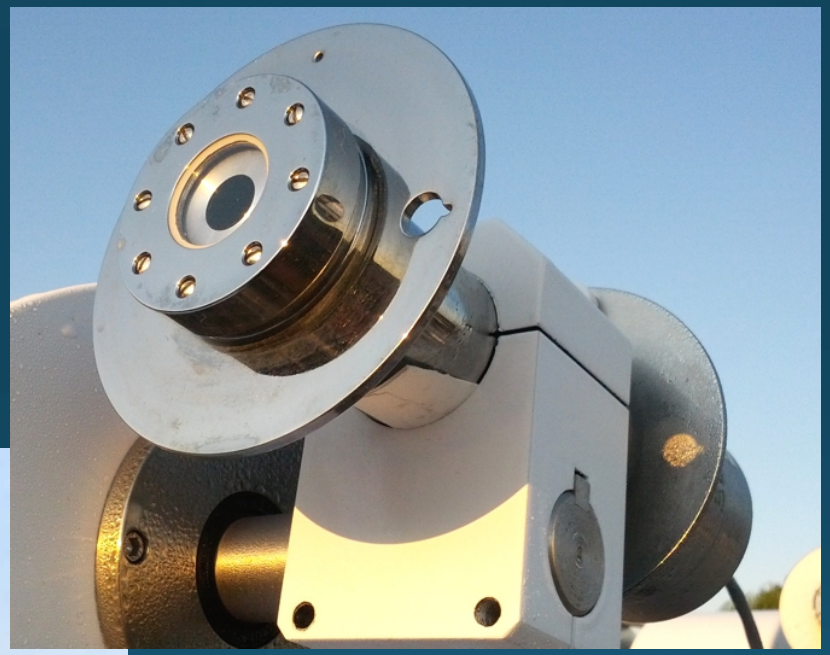
Automatic (digital)
Smart Tracker

Eppley Model SMT



John's Key Contributions





Jim Kendall Sr & Ed Flowers
At NRIP

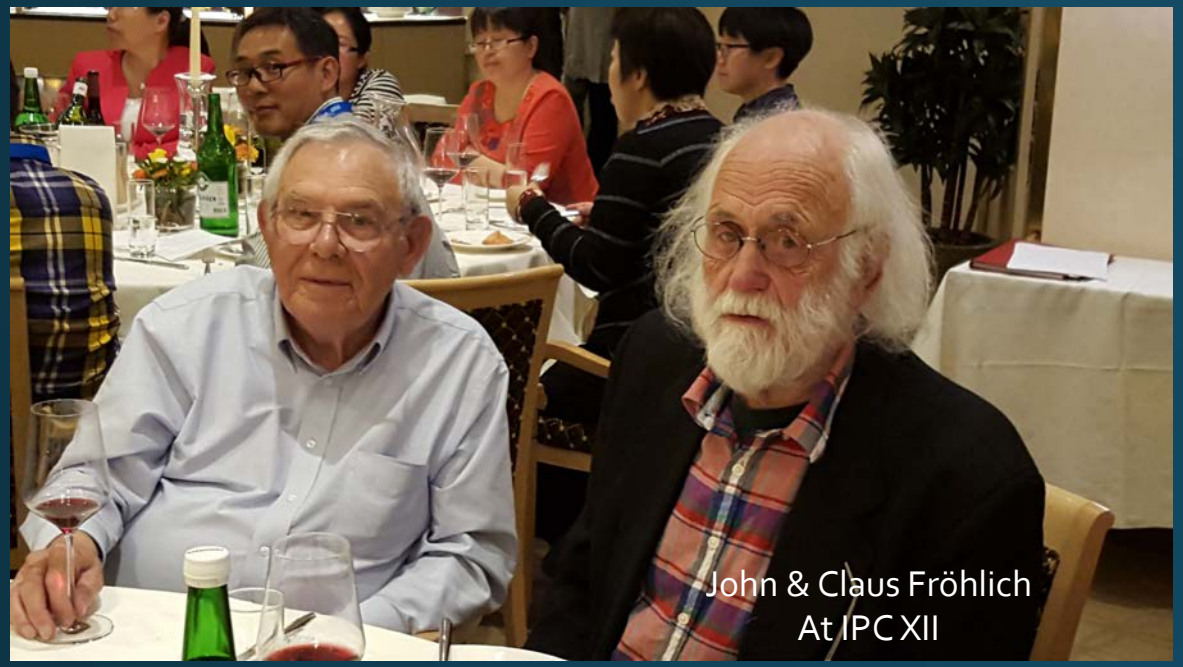

Tom Kirk & John
At IPC XI


John, Don Nelson, & Tom Stoffel
At IPC IX


Craig Webb & John
At IPC XI


Wim Zaaiman, John, & Bruce Forgan
At IPC XI


John & Erik Naranen
At IPC XI



John & Claus Fröhlich
At IPC XII

John & Reda
Blackbody Set-up 2001

John, Jim Windell, & Julian Gröbner
At IPGC XII

Thank You John

For your thoughtful leadership, hard work, and devotion to
Family, Community, and Science

Acknowledgements

Hope Hickey
Tom Kirk
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Daryl Myers
Wim Zaaiman
Gene Zerlaut