

# TrevorFest 2013

*Some concluding observations & thank yous*

*Trevor,*

*It has been a long  
and winding road  
from Glencullen '62  
to the contemporary  
scene ... could you  
ever have imagined  
quite how much  
would be  
accomplished ?*



**08:30-08:50** David Fegan, University College Dublin  
"TCW@UCD 1962-1966"

~25 years

**08:50-9:20** Giovanni Fazio, Harvard-Smithsonian Center For Astrophysics  
"The Beginning of Gamma-Ray Astronomy at the Whipple Observatory"

**9:20-9:40** Valerie Connaughton, University of Alabama in Huntsville  
"Exploding Primordial Black Holes"

**09:40-10:10** Richard Lamb, University of Kentucky  
"The Path to Imaging Leading to The First Crab Detection"

**10:30-10:50** John Quinn, University College Dublin  
"The Whipple AGN Era"

**10:50-11:10** Patrick (Jojo) Boyle, McGill University  
"The ARTEMIS Project"

**11:10-11:40** Kenneth Gibbs, Smithsonian Astrophysical Observatory  
"The Road to and Success of VERITAS"

~25 years



**1:20-1:40 Alice Harding, NASA GSFC**  
**"The Crab Nebula From a Theorist's Perspective"**

**1:40-2:00 Elizabeth Hays, NASA GSFC**  
**"The Crab Nebula From an Observational Perspective"**

**2:00-2:25 Frank Krennrich, Iowa State University**  
**"Progress in Understanding AGN and the EBL"**

**02:25-02:50 Razmik Mirzoyan, MPI Munich**  
**"Technological Advances in Ground Based Gamma-ray Astronomy"**

**3:20-3:45 Michael Punch, Laboratoire d'Astroparticule et Cosmologie-APC, CEA**  
**"Results From The H.E.S.S. Array of IACTs"**

**3:45-4:10 Francis Halzen, University of Wisconsin at Madison**  
**"News from IceCube"**

**4:10-4:35 Alan Watson, University of Leeds**  
**"Recent results from the Pierre Auger Observatory"**

**4:35-5:00 Gus Sinnis, Los Alamos National Laboratory**  
**"HAWC: The High Altitude Water Cherenkov Observatory"**

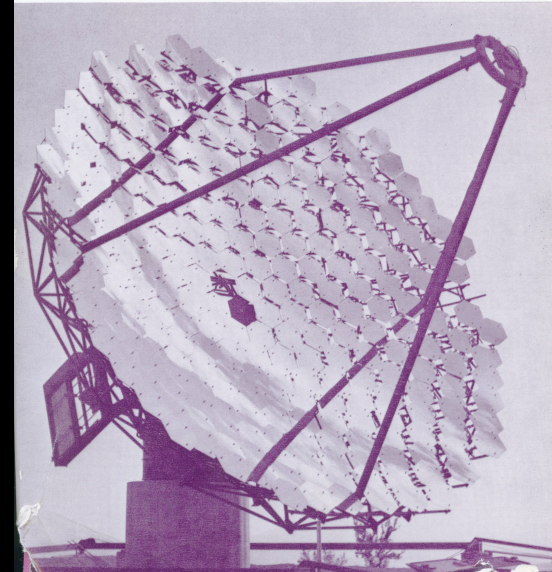
**5:15-5:45 James Buckley, Washington University at St. Louis**  
**"CTA and The Road Ahead"**

**Thank you  
speakers**

Looking right back to your 1968 book, there is a very telling sentence, written as part of the PREFACE ....

## High-Energy Astrophysics

TREVOR C. WEEKES



.... "Where possible the observational aspects will be emphasized, since astrophysics suffers from a dearth of meaningful observations; ... the extension of existing techniques is thus all-important for the development of the discipline."

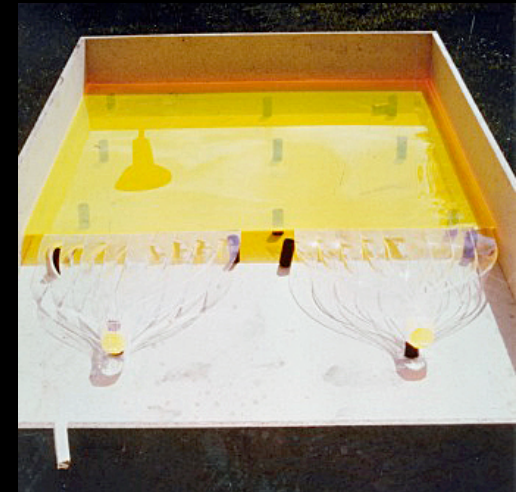


c 1971 : 10m reflector + radio dishes



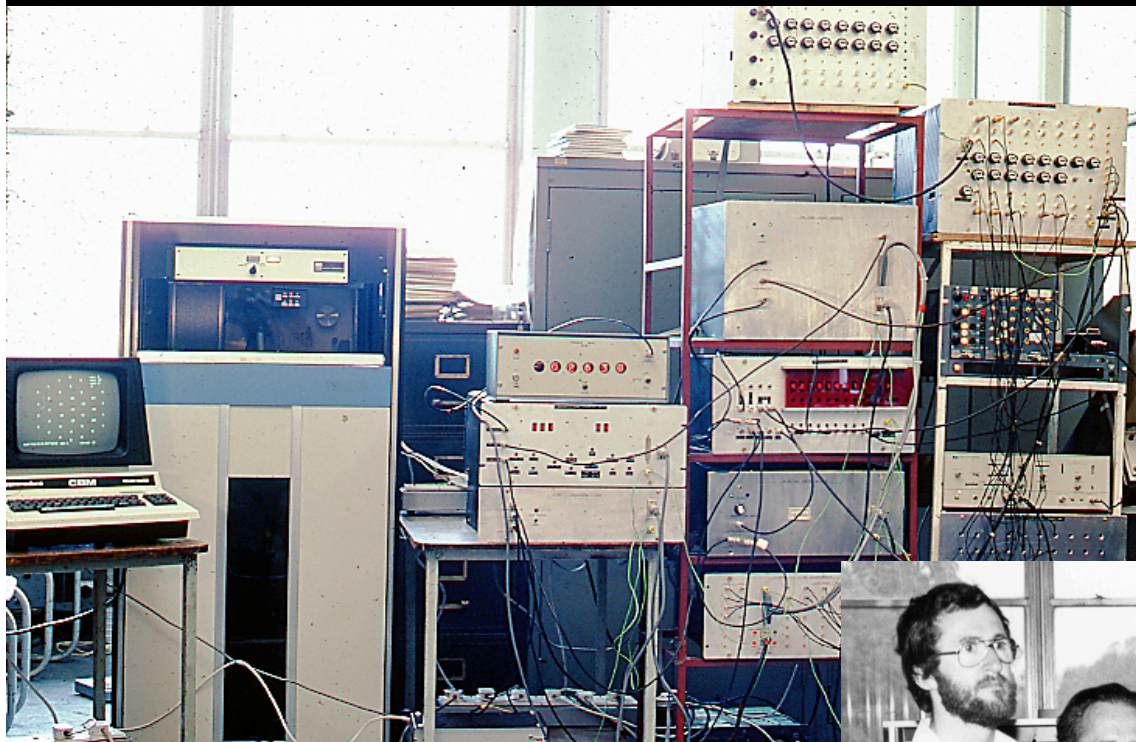


# Summer 1979 – SANDIA LABS, Albuquerque





# 1980 - 82 ... the 1<sup>st</sup> imaging camera



7, 19, 37 Phototube  
Cameras



Trevor

McLaughlin, Porter, MacNeill, Cawley, Clear & Fegan

at UCD April 1982





1982:  
Whipple Collaboration formed by  
Hawaii, ISU, SAO, UCD, Durham UK



Gibbs  
Harris &  
Weekes





TrevorFest Sat Oct 26th 2013



# 1985, ICRC San Diego



Hillas, Gibbs, Gorham, Stenger, Liebing, Visitor (?), Lamb, Weekes, Fegan



# First claim of a detection - Crab Nebula $5.6\sigma$ , 37 pixels



131 OG 2.3-1

**OBSERVATIONS OF THE CRAB NEBULA AT ENERGIES  $> 4.10^{11}$**

M.F. Cawley<sup>1</sup>, D.J. Fegan<sup>1</sup>, K. Gibbs<sup>2</sup>, P.W. Gorham<sup>3</sup>,  
R.C. Lamb<sup>4</sup>, D.F. Liebing<sup>4</sup>, P.K. MacKeown<sup>5</sup>, N.A. Porter<sup>1</sup>,  
V.J. Stenger<sup>3</sup>, and T.C. Weekes<sup>2</sup>.

1. Physics Department, University College, Dublin.
2. Harvard-Smithsonian Center for Astrophysics.
3. Physics Department, University of Hawaii.
4. Physics Department, Iowa State University.
5. Physics Department, University of Hong Kong.

Definition of new parameter  
1 TCW = 3.7 pixels/author

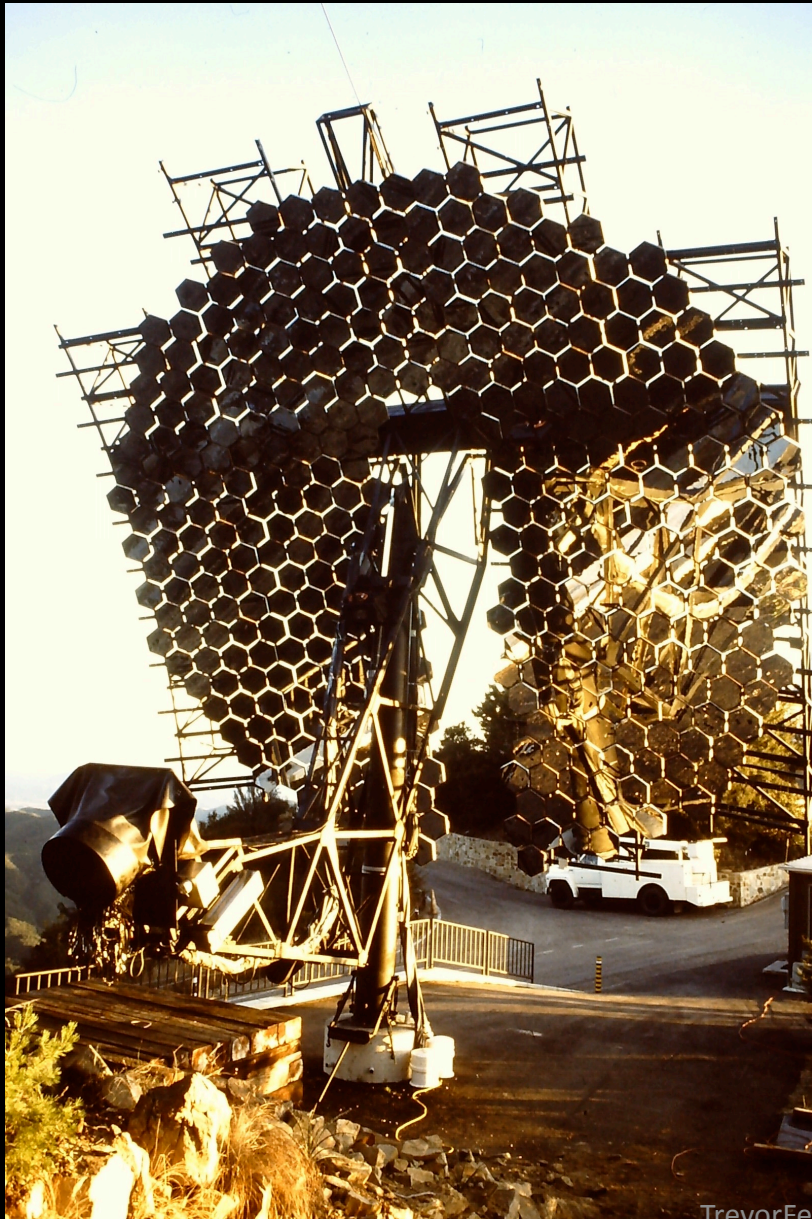


# 1987-1993 - Complementing the 10 reflector with a small EAS Array





# 1992 — Stereoscopic Imaging with GRANITE



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# The LEVIATHAN

Birr Castle, Ireland

Phys. Perspect. 12 (2010) 146–162  
© 2010 US Government  
1422-6944/10/020146-17  
DOI 10.1007/s00016-010-0018-5

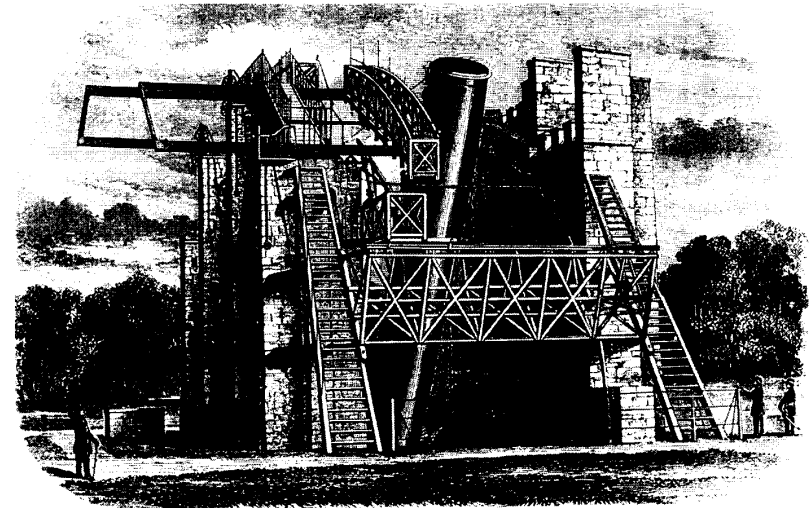
**Physics in Perspective**

## The Nineteenth-Century Spiral Nebula Whodunit

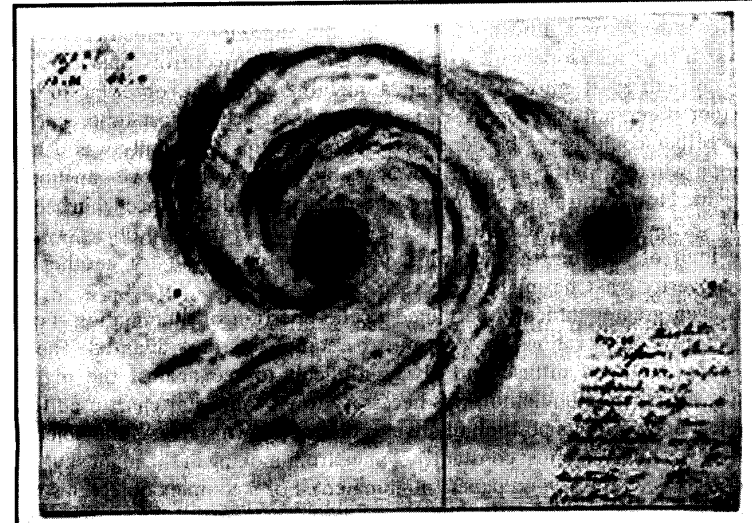
Trevor C. Weekes\*

152 T. C. Weekes

Phys. Perspect.



**Fig. 5.** Lord Rosse's 72-inch telescope, the Leviathan. *Credit:* Birr Scientific and Heritage Foundation.





# If TeV Gamma ray astronomy had been an olympic sport ...

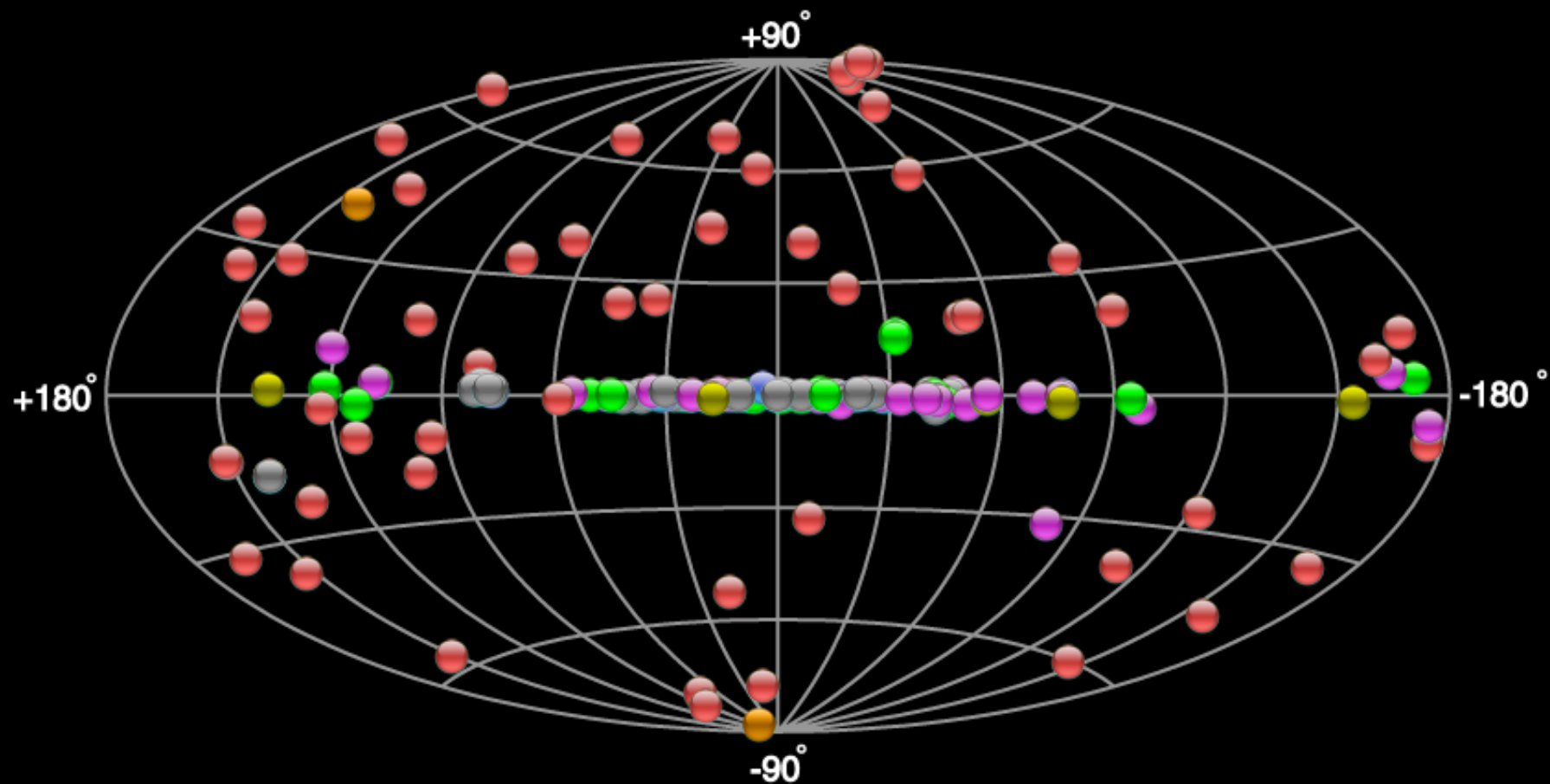
1964	XVIII	 Tokyo, Japan
1968	XIX	 Mexico City, Mexico
1972	XX	 Munich, West Germany
1976	XXI	 Montreal, Canada
1980	XXII	 Moscow, Soviet Union
1984	XXIII	 Los Angeles, United States
1988	XXIV	 Seoul, South Korea
1992	XXV	 Barcelona, Spain
1994		
1996	XXVI	 Atlanta, United States
1998		
2000	XXVII	 Sydney, Australia
2002		
2004	XXVIII	 Athens, Greece
2006		
2008	XXIX	 Beijing, China <sup>[e][193]</sup>
2010		
2012	XXX	 London, United Kingdom



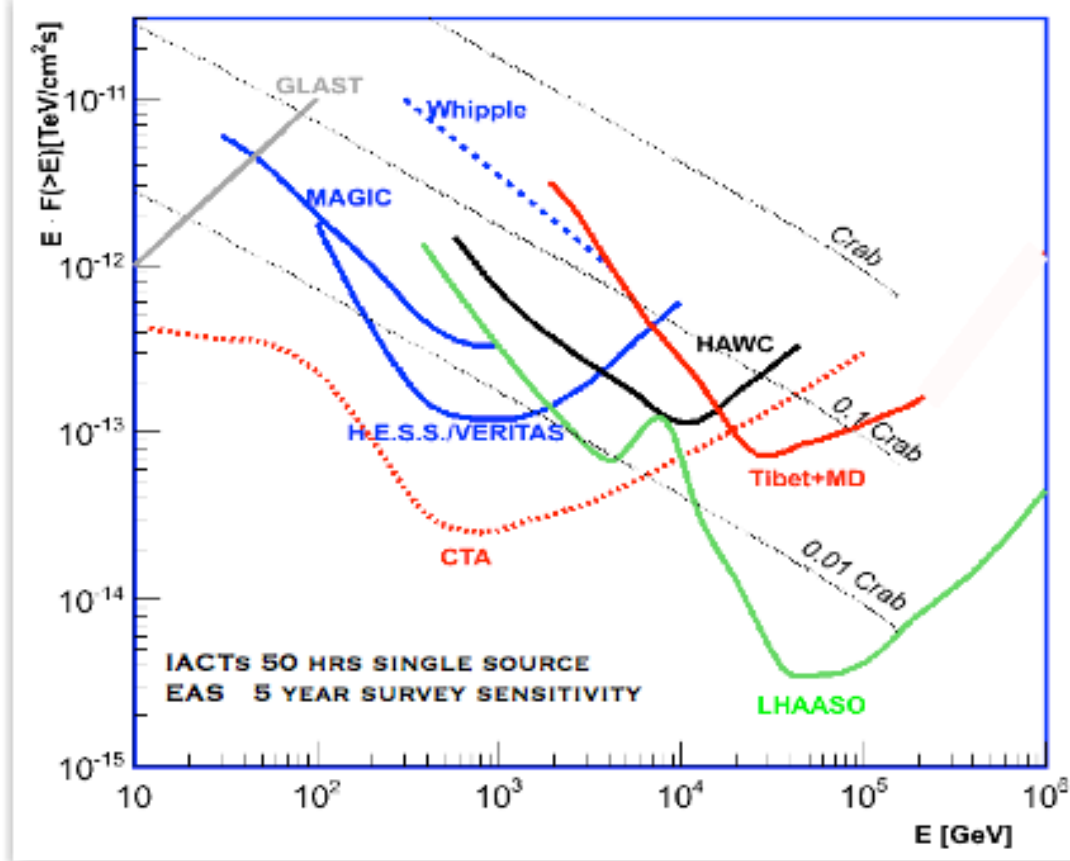
then Trevor Weekes surely has been the peerless torch bearer for more than 5 decades

# TeV Sky Map 2013

*Welcome to TeVCat!*



## Minimum detectable Energy Flux sensitivity



**Fig. 1** Energy-flux sensitivities of current and future ground-based detectors - the IACT and EAS arrays in the energy range  $10^{10}$  to  $10^{15}$  eV (courtesy of G. Sinnis).

1964 GLENCULLEN  
 $EF \sim 2 \times 10^{-10} \text{ erg cm}^{-2} \text{ s}^{-1}$

2014 H.E.S.S./VERITAS  
 $EF \sim 2 \times 10^{-13} \text{ erg cm}^{-2} \text{ s}^{-1}$

20XX CTA  
 $EF \sim 2 \times 10^{-14} \text{ erg cm}^{-2} \text{ s}^{-1}$



Without your patience & support this could not have happened  
- thank you!





## TrevorFest 2013 ... the event

### IDEA :

A number of individuals have kicked the idea around over the past couple of years but Andy Smith ignited the touch-paper and made it happen.

### SCIENTIFIC ORGANIZATION & SPEAKER PROGRAM:

James Buckley, David Fegan, Stephen Fegan, Ken Gibbs, Jamie Holder, Deirdre Horan, Dave Kieda, Frank Krennrich, Julie McEnery, Rene Ong, John Quinn & Andy Smith.

### EVENT ORGANIZATION & LOGISTICS:

Katherine Skollinsberg & Dave Kieda

### SPONSORSHIP ORGANIZATION:

Dave Kieda.

### CORPORATE & INSTITUTIONAL SPONSORS:

M3 (Engineering),  
Displays and Optical Technologies Inc (DOTI)  
Smithsonian Astrophysical Observatory (SAO)  
University of California Los Angeles (UCLA)  
The University of Utah (UU)  
McGill University  
University College Dublin (UCD)

**OUR 16 SPEAKERS – FOR SUMMARISING THE ACHIEVEMENTS OF  
TREVOR AND HIS INFLUENCE ON HIGH ENERGY ASTROPHYSICS.**



**Whipple & VERITAS  
(AGENCY research support funding)**

**Smithsonian Astrophysical Observatory (SAO), particularly the exceptional support of Irwin Shapiro**

**Smithsonian Scholarly Studies Fund**

**NSF, noting the help and support of Vern Pankonin**

**DOE, noting the support and encouragement of P.K.Williams and Kathy Turner**

**NASA**

**NATO**

**PPARC (UK)**

**NBST and SFI (Ireland)**

**NSERC (Canada)**

## **Whipple & VERITAS (Basecamp and Mountain support : 1968 – today)**

At the basecamp, very special thanks are due to the administrative staff, in particular to Karen Myres and Grace Alegria .

The mountain support crew underpinned all of the infrastructural backup in the shape of electrical, mechanical and workshop support. Over the decades, no task was too great for Don Hogan and his various teams, despite the various outlandish nature of some of the calls made by the gamma-ray group.

Right from the very beginning, Kevin Harris was central to the development of the original 10m imaging system and his talents and contributions are recognized with appreciation.

VERITAS has been a particularly challenging project, from 1996 through 2007 when 1<sup>st</sup> light was achieved. As Project Manager, Steve Criswell was the person who, through his persistent commitment and painstaking attention to detail, made VERITAS a successful reality.

VERITAS owes just so much to the Deputy Project Manager, Ken Gibbs. As project 'wrangler-in-chief', he organized/cajoled/browbeat the teams building the various subsystems. He became expert on just about every sub-system.

VERITAS throughout its development phase posed many technical problems that were frequently resolved through the expertise of Danny West and Cesar Lopez. Project Administrator until very recently has been Gene Gardner.

VERITAS today prospers through the endeavors of - Pascal Fortin (Operations Manager), Steve Criswell (Project Manager), Jack Musser, Emmet Roache and George Jones (Technical Support).