REPORT from the International Neutrino Commission Meeting of 4 June 2014, Boston, Massachusetts and

A Few "Highlights" from Early Neutrino XXXX "History"

J. Schneps

NEUTRINO 2014 7 June 2014

'Official' List

INTERNATIONAL CONFERENCE ON NEUTRINO PHYSICS AND ASTROPHYSICS

1. NEUTRINO 1972	Balaton, Hungary		
George Marx*	139	15. NEUTRINO 1992	Granada, Spain
2. NEUTRINO 1974	Philadelphia,PA, USA	Angel Morales*	261
Sidney Bludman	???	16. NEUTRINO 1994	Eilat, Israel
3. NEUTRINO 1975	Balaton, Hungary	Arnon Dar	28́8
George Marx *	171	17. NEUTRINO 1996	Helsinki, Finland
4. NEUTRINO 1976	Aachen, Germany	Matts Roos	308
Helmut Faissner*	267	18. NEUTRINO 1998	Takayama, Japan
5. NEUTRINO 1977	Elbrus, USSR	Yoichiro Suzuki, Yoji Totsuka* 339	
Markov*, Tavkhelidz	e*, Zatsepin* 209	19. NEUTRINO 2000	Sudbury, Canada
6. NEUTRINO 1978	Lafayette, IN, USA	Art McDonald	395
Earle Fowler*	264	20. NEUTRINO 2002	Munich, Germany
7. NEUTRINO 1979	Bergen, Norway	Franz v.Feilitzsch, Nor	rbert Schmitz 410
Cecilia Jarlskog	252	21. NEUTRINO 2004	Paris, France
8. NEUTRINO 1980	Erice, Italy	François Vannucci, Da	,
Ettore Fiorini	~100	22. NEUTRINO 2006	Santa Fe, NM, USA
9. NEUTRINO 1981	Maui, Hawaii, USA	Thomas Bowles	~450
Vincent Peterson *	191	23. NEUTRINO 2008 Chi	ristchurch, N. Zealand
10. NEUTRINO 1982	Balaton, Hungary	J. Adams, F. Halzen,	· · · · · · · · · · · · · · · · · · ·
Deszo Kiss*, George Marx* 199		24. NEUTRINO 2010	Athens, Greece
11. NEUTRINO 1984 N		George Tzanakos*	455
Konrad Kleinknecht	232	25. NEUTRINO 2012	Kyoto, Japan
12. NEUTRINO 1986	Sendai, Japan	T. Kobayashi, M. Nakal	• • •
Toshio Kitagaki	230	•	•
13. NEUTRINO 1988	Boston, MA, USA	26. NEUTRINO 2014 Gary Feldman, Ed Ke	Boston, MA, USA arns 539
Jacob Schneps	334		arris 55)
14. NEUTRINO 1990	Geneva, Switzerland	* Deceased	
Klaus Winter	339		

PRELUDES and NUMEROLOGY

Proceedings of NEUTRINO 1972 (1st), it was called the 4th. 3 previous conferences, now called preludes;1965, 1968, 1970.

Proceedings of NEUTRINO 1981: Introduction – it's the 11th. Closing talk – it became the 9th.

The International Neutrino Commission defined 1972 as the 1st.

What and where were these three preludes?

1965, CERN: "Informal Conference on Experimental Neutrino Physics" The complete Proceedings can be found on the web! 86 attended.

1968, Moscow: Mainly neutrino astrophysics. Proceedings?

1970, Cortona, Italy: Mainly neutrino astrophysics. Proceedings?

(Un)Highlights Over the Years

1965 – V. Weisskopf, Director General, CERN "This conference is an historic event. I do not think there was ever a conference on neutrinos, so let us be conscious of something new in this world."

T.D. Lee: In 2 years hardware used in neutrino physics increased a factor of 10 in mass; this extrapolates to the total mass of the earth in about forty years. (he was right).

- 1972 Weisskopf: Salam-Weinberg model has issues, e.g., zero masses for the fermions (<u>but there is this possibility of a scalar field</u>), <u>it also predicts neutral currents (found just a year later).</u>
- 1974 Feynman: The solar neutrino problem is only 1.5 standard deviations off some solar models, so no need to discuss it here.
- 1975 First evidence from SLAC for the tau lepton presented (but few believed it).
- Okun: On theory, "perhaps a model with 6x3 colored quarks would explain better what we see, however, these models look pretty ugly, so many [of us] do not believe in them".
- 1976 It is noted that A. Mann and H. Primakoff are proposing a long baseline neutrino beam, 1,000 km, Fermilab to Quebec. Phys.Rev. 1977. (They were ~40 years ahead of their time). Solar neutrinos, we don't understand them.
- 1978 Primakoff: Are there neutrino oscillations? and if so do they exhibit CP non-conservation? (36 years ago! We're still asking, but when?)

- 1979 Where is the top quark? Best guesses are $3 < m_t < 15 \text{ GeV}$ (a little bit off).
- 1980 ITEP measuring v_e mass, tritium β -decay. 14 < m_v < 46 eV!!
- 1984 UA1(W,Z 1983) Rubbia reports 6 top candidates, mass 30 to 50 GeV, but no claim; However,
- Steinberger summary: "This conference was particularly honoured to be selected as the <u>historic</u> site for the first presentation of the UA1 evidence for the existence of top quarks and a rough measure of their mass."
- $1986 ITEP : 17 < m_v < 40 \text{ eV}$. But, 3 new exps. give $m_v < 18-30 \text{ eV}$. Solar v's, emergence of the MSW matter effect as an explanation.
- 1988 Supernova 1987a. L. Okun predicts the next Supernova in our galaxy: date 2003±15 A.D. (note the minus sign).
- ITEP: $m_{ve} = 26\pm6 \text{ eV}$; other experiments: $m_{ve} < 32 \text{ eV}$.
- Kamiokande reported atmospheric v_{μ} deficit, suggested $v_{\mu} \rightarrow v_{\tau}$ oscillations (not taken seriously by many).

- 1990 LEP: The Z width fits best to 3 neutrinos. New result from a gaseous tritium source gave $m_v < 9.4$ eV. No report from ITEP.
- 1992 The concluding talk by De Rujula, entitled "Inconclusive Talk", was (properly?) not published.
- 1996 Ellis: dramatic result from LSND (1995) needs checking 1998 SuperKamiokande confirms atmospheric ν oscillations.
- 2000 2002 --First observation of solar neutrino CC's and NC's by SNO. Confirmed solar neutrino oscillations.
- $\mathbf{V}_{\mathbf{T}}$ First direct detection.
- Confirm or reject LSND (still alive) MiniBooNe will do it.
- 21st Century You've been hearing all about that this week (a more complete history will appear in the Proceedings)
 SO, TO THE FUTURE

Attending the INC meeting of 4 June 2014

Gary Feldman – NEUTRINO 2014, Boston Ettore Fiorini - NEUTRINO 1980, Erice Ed Kearns - NEUTRINO 2014, Boston John Learned – NEUTRINO 1981. Hawaii William Louis – NEUTRINO 2006, Santa Fe Masayuki Nakahata - NEUTRINO 2012, Kyoto Tsuyoshi Nakaya - NEUTRINO 2012, Kyoto Vittorio Palladino – WIN workshops Stephen Parke - NEUTRINO 2008, Christchurch (chair-elect, effective at close of NEUTRINO 2014) Norbert Schmitz – NEUTRINO 2002, Munich Jacob Schneps (chair) - NEUTRINO 1988, Boston Yoichiro Suzuki - NEUTRINO 1998, Takayama François Vannucci - NEUTRINO 2004, Paris

The MEETING: Agenda & Discussion

 We had a report from Gary Feldman and Ed Kearns on NEUTRINO 2014 and congratulated them and the Local Organizing Committee for a memorable conference.

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Highlights -
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63 talks:30(Europe),23(N. America),10(Asia/Oceania)

287 Posters

551 Participants

And a balanced budget

- 2. Ken Long gave an update on planning for NEUTRINO 2016 in London organization, facilities, costs and -- excursions. It's coming along very well.
- 3. Manfred Lindner and Guido Drexlin gave us an update on planning for NEUTRINO 2018 in Heidelberg and that is also going well.
- 4. We heard several proposals for NEUTRINO 2020 and beyond:
- Steven Brice presented a proposal on behalf of Chicago or Minneapolis, the American Neutrino Heartland.
- Soo-Bong Kim presented a proposal for Seoul in Korea.
- Ettore Fiorini presented a proposal on behalf of the Universitá di Milano.
- Wei Wang presented a proposal for Guangzhou in China.

Ken Long, Imperial College (Chair)



http://neutrino2016.iopconfs.org

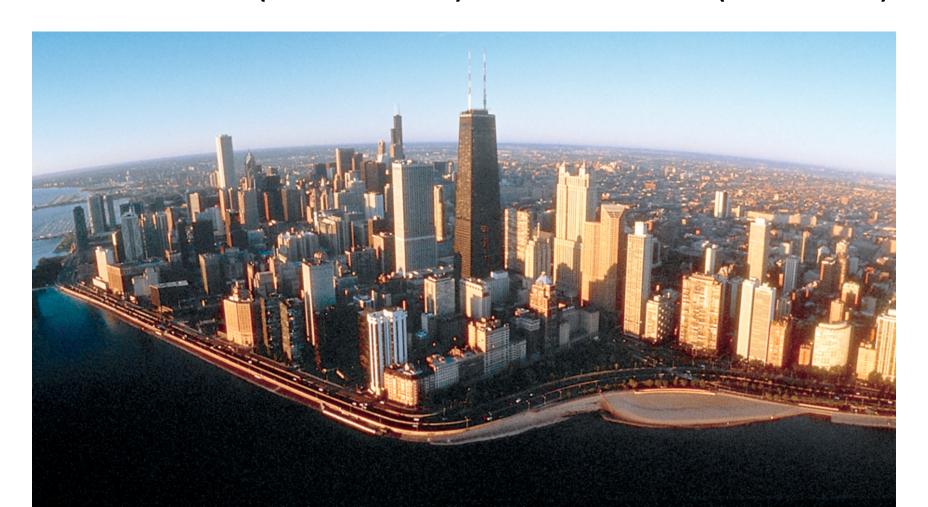
NEUTRINO 2018 in Heidelberg

Manfred Lindner, MPI Heidelberg(Chair) Guido Drexlin, Karlsruhe, (Co-chair)



Neutrino 2020 - Chicago in the American Neutrino Heartland

M. Marshak (Minnesota) and J. Morfin (Fermilab)



Future Conferences

Given that new experiments in neutrino physics now have time scales of the order 20 years and longer we can take a look what things may look like over that period for the Neutrino conferences. Tentative outline.

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2016 London
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2018 Heidelberg

2020 Chicago

2022 Asia-Pacific

2024 Europe

2026 Americas

2028 Asia-Pacific

2030 100th Anniversary of Pauli's prediction etc.

We have an Expression of Interest and have

reserved this one:

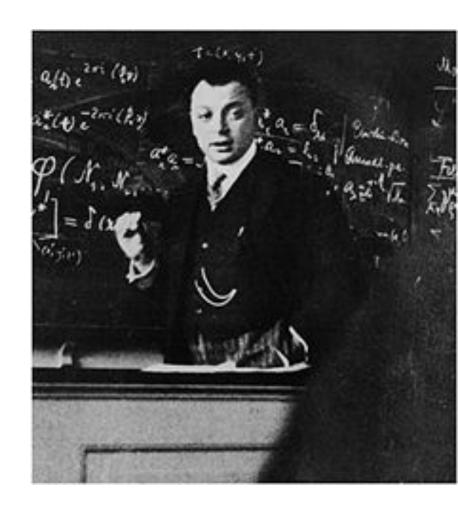
NEUTRINO 2030

(PAULI NEUTRINO CENTENNIAL)

Zurich

André Rubbia

(to be reviewed in 2024)



Two years ago I told you I would be stepping down as chair of the INC at the end of NEUTRINO 2014 so that moment is quickly arriving. Succeeding me will be someone most of you know, Stephen Parke, so from now on all complaints, advice, etc. can be directed to him. So please welcome Stephen now as the new chair of the INC.