



«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE

INTERNATIONAL SCHOOL OF COSMIC-RAY ASTROPHYSICS
«MAURICE M. SHAPIRO»

*24th Course: “Particles and the Cosmos – Bridging the infinitesimal and the infinite”
29 July – 6 August 2026*

PRESIDENT AND DIRECTOR OF THE CENTRE: PROFESSOR A. ZICHICHI

DIRECTORS OF THE COURSE: PROFESSORS J.R. HÖRANDEL, R. SPARVOLI, T. STANEV

WELCOME!



INTERNATIONAL SCHOOL OF COSMIC-RAY ASTROPHYSICS: • Progress and Problems in Cosmic Ray Physics - 1978 • Acceleration of Particles in Nature - 1980 • Composition and Origin of Cosmic Rays - 1982 • Cosmic Radiation in Contemporary Astrophysics - 1984 • Genesis and Propagation of Cosmic Rays - 1986 • Cosmic Gamma Rays and Cosmic Radiation - 1988 • Cosmic Rays, Supernovae, and the Interstellar Medium - 1990 • Particle Astrophysics and Cosmology - 1992 • Currents in High Energy Astrophysics - 1994 • Toward the Millennium in Astrophysics: Problems and Prospects - 1996 • New Vistas in Astrophysics - 1998 • Astrophysical Sources of High Energy Particles and Radiation - 2000 • Relativistic Astrophysics and Cosmology - 2002 • Neutrinos and Explosive Events in the Universe - 2004 • Astrophysics at Ultra-high Energies - 2006 • Gamma Ray and Cosmic Ray Astrophysics: From below GeV to beyond TeV Energies - 2008 • Astro & Particle Physics: From Underground to Outer Space - 2010 • A New Era in Particle Astrophysics - 2012 • Exploring the High Energy Universe - 2014 • Particles, Gamma-ray and Neutrino Astrophysics in the 21st Century - 2016 • Astroparticle Physics: yesterday, today, and tomorrow - The 40th anniversary of the ISCR - 2018 • From Cosmic Particles to Gravitational Waves - now and to come - 2022 • Multi-Messenger Astroparticle Physics - 2024

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INTERNATIONAL SCHOOL OF COSMIC-RAY ASTROPHYSICS

«MAURICE M. SHAPIRO»

position and Origin of Cosmic Rays, 1988 • Cosmic Rays, problems and physics problems and 202 • Neutrinos and Astro & Particle Physics in the 21st Century - 2016 • No Astrophysics in the future - 2022

24th Course: “*Particles and the Cosmos – Bridging the infinitesimal and the infinite*”
29 July – 6 August 2026

COURSES OF THE INTERNATIONAL SCHOOL OF COSMIC RAY ASTROPHYSICS

1978	Progress and Problems in Cosmic Ray Physics	Maurice M. Shapiro
1980	Acceleration of Particles in Nature	Maurice M. Shapiro
1982	Composition and Origin of Cosmic Rays	Maurice M. Shapiro
1984	Cosmic Radiation in Contemporary Astrophysics	Maurice M. Shapiro
1986	Genesis and Propagation of Cosmic Rays	Maurice M. Shapiro, John P. Wefel
1988	Cosmic Gamma Rays and Cosmic Neutrinos	Maurice M. Shapiro, John P. Wefel
1990	Cosmic Rays, Supernovae, and the Interstellar Medium	Maurice M. Shapiro, Rein Silberberg, John P. Wefel
1992	Particle Astrophysics and Cosmology	Maurice M. Shapiro, Rein Silberberg, John P. Wefel
1994	Currents in High Energy Astrophysics	Maurice M. Shapiro, Rein Silberberg, John P. Wefel
1996	Towards the Millennium in Astrophysics - Problems and Prospects	Maurice M. Shapiro, Rein Silberberg, John P. Wefel
1998	New Vistas in Astrophysics	Maurice M. Shapiro, Rein Silberberg, Todor Stanev, John P. Wefel
2000	Astrophysical Sources of High Energy Particles and Radiation	Maurice M. Shapiro, Todor Stanev, John P. Wefel
2002	Relativistic Astrophysics and Cosmology	Maurice M. Shapiro, Todor Stanev, John P. Wefel

**24 courses
topics evolved
cosmic-ray astrophysics**



astroparticle physics

- **direct & indirect measurements of cosmic rays**
- **gamma-ray astronomy**
- **neutrino astronomy**
- **gravitational waves**



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29 July – 6 August 2026

2004	Neutrinos and Explosive Events in the Universe	Maurice M. Shapiro, Todor Stanev, John P. Wefel
2006	Astrophysics at Ultra-high Energies	Maurice M. Shapiro, Todor Stanev, John P. Wefel
2008	Gamma Ray and Cosmic Ray Astrophysics - From Below GeV to Beyond EeV Energies - Including tribute session for Maurice M. Shapiro, who had passed the previous year. ISCR named in his honor.	Todor Stanev, John P. Wefel
2010	Astro & Particle Physics - From Underground to Outer Space	Todor Stanev, John P. Wefel
2012	A new Era in Particle Astrophysics - New instruments, New Results and New Understanding	Jörg R. Hörandel, Todor Stanev, John P. Wefel
2014	Exploring the High Energy Universe	Jörg R. Hörandel, Todor Stanev, John P. Wefel
2016	Particle, Gamma-ray and Neutrino Astrophysics in the 21st Century	Jörg R. Hörandel, Todor Stanev, John P. Wefel
2018	Astroparticle Physics - Yesterday, Today and Tomorrow	Jörg R. Hörandel, Todor Stanev, John P. Wefel
2022	From Cosmic Particles to Gravitational Waves - Now and To Come	Jörg R. Hörandel, Todor Stanev, John P. Wefel
2024	Multi-messenger Astroparticle Physics	Jörg R. Hörandel, Roberta Sparvoli, Todor Stanev, John P. Wefel
2026	Particles and the Cosmos - Bridging the Infinitesimal and the Infinite	Jörg R. Hörandel, Roberta Sparvoli, Todor Stanev

**24 courses
topics evolved
cosmic-ray astrophysics**



astroparticle physics

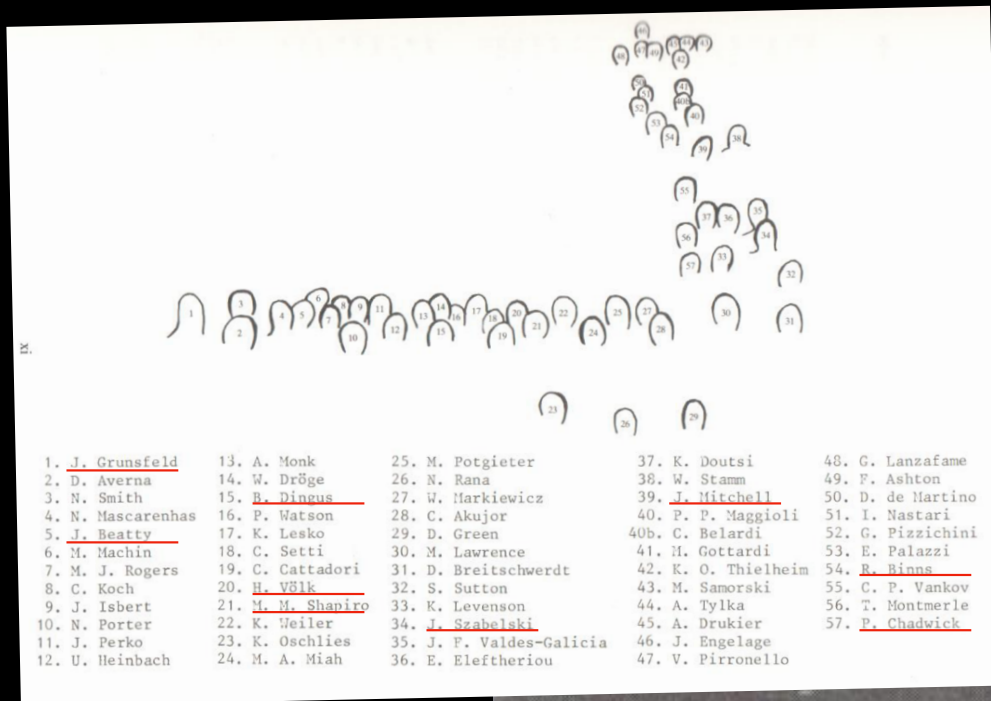
- **direct & indirect measurements of cosmic rays**
- **gamma-ray astronomy**
- **neutrino astronomy**
- **gravitational waves**



The 1st International
School of Cosmic Ray
Astrophysics (1978)
Director of the School
M. M. Shapiro

1	2 Jeremy Lloyd-Evans	3 Ray Wills?	4	5	6 J. Kempler	7 Janet Luhmann	8 Kostas (Greek, Milan?)
<u>9 Ellen Zweibel</u>	10 G. Erdős (?)	11 Vic Stenger	12 Jorge Perez-Pereza	13 Yves David	14 John Clifford	15 Jake Waddington	<u>16 Maurice Shapiro</u>
17 Juan Sequiros	18 Carmen Baixeras	19	20 Maria Giller	21 G. Siegmon	22 Elana Ashley	23 Andy Strong ?	24 Rudolph Beaujean
25	26 Javiev Ottaola	27	<u>28 Helma Bilokon</u>	29	30 Einar Juliusson	31	32
33	34	<u>35 Rein Silverberg</u>	36	<u>37 Oscar Saavedra</u>	38 Willi Niemann	39	40
41	<u>42 Reinhard Schlickeiser</u>	43	<u>44 T. Gregory Guzik</u>	45	46	<u>47 Peter Fowler</u>	<u>48 John Linslev</u>
49 Piero Galeotti	50 Harm Moraal	51	52 Satio Hayakawa	53 John Simpson?	<u>54 Fred Reines</u>	<u>55 David Schramm</u>	56 Roger Bussard
<u>57 Todor Stanev</u>	58 John Cooper	<u>59 Simon Swordy</u>	60 Steve Jordan	61	62 Reuven Ramaty	63	64 J C Carvalho
<u>65 Subir Sarkar</u>	<u>66 Arnold Wolfendale</u>	67	<u>68 Alan Watson</u>	69			

International School of Cosmic Ray Astrophysics 1986

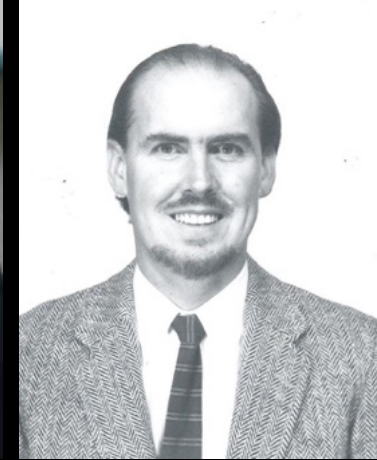


Grunsfeld
SpaceShuttle 1995-2009



International School of Cosmic Ray Astrophysics 1988

Edoardo Amaldi
Peter Biermann
Alexander Chudakov
David Kieda
John Linsley
Gianni Navarra
Livio Scarsi
Maurice Shapiro
Rein Silberberg
Todor Stanev
Floyd Stecker
Simon Swordy
K.O. Tielheim
John P. Wefel
Tadeusz Wiebig
Arnold Wolfendale
Guarang B. Yodh



International School of Cosmic Ray Astrophysics 1990

James Buckley
Rolf Büttikofer
Luke O'Connor Drury
Sunil K. Gupta
Albrecht Karle
Vladimir Ptuskin
Dolores Rodriguez Frias
Erwin Schopper
Maurice Shapiro
Rein Silberberg
Manfred Simon
Todor Stanev
John P. Wefel
Arnold W. Wolfendale



Erwin Schopper
PhD in group of Regener in
Stuttgart
Apollo-Sojus Test Project 1975

International School of Cosmic Ray Astrophysics 1992

Evgeny Berezhko
Konrad Bernlöhner
Lev Dorman
William Fowler
Einar Juliusson
Frank Krenrich
Jeremy Lloyd-Evans
Martin Pohl
Raymond Protheroe
Eun-Suk Seo
Maurice Shapiro
Rein Silberberg
Todor Stanev
Klaus Tielheim
John P. Wefel
Arnold W. Wolfendale



International School of Cosmic Ray Astrophysics 1994

Lev Dorman
Vitaly L. Ginzburg
German Hermann
Gottfried Karbach
Georg B. Kristiansen
Clem Pryke
Olaf Reimer
Maurice M. Shapiro
Rein Silberberg
Todor Stanev
Klaus Tielheim
John P. Wefel



Vitaly L. Ginzburg



Olaf Reimer
as lecturer 2016

International School of Cosmic Ray Astrophysics 1996



International School of Cosmic Ray Astrophysics 2004



Aharonian



Goodman



Müller



Kuzmin



Smith



Teshima



Maris



Scherini



Ptuskin



Riccobene



Hörandel

International School of Cosmic Ray Astrophysics 2006



Spiering



Smith



Privitera

International School of Cosmic Ray Astrophysics 2008



Schröder

Ptuskin

Teshima

Schoorlemmer

Casolino

Smith

Hans

Wissel

Israel

Stanev

Wefel



Watson



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DIRECTORS OF THE COURSE: PROFESSORS J.R. HÖRANDEL, R. SPARVOLI, T. STANEV

**In case of questions,
contact one of the directors**



J. Hörandel

Roberta Sparvoli



J. Hörandel

Jörg Hörandel

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«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC STUDIES

INTERNATIONAL SCHOOL OF COSMIC-RAY ASTROPHYSICS

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We have 12 lecturers.

We have about 80 participants.

We have friends from about 18 countries being present.

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THE ERICE STATEMENT

- *It is unprecedented* in human history that mankind has accumulated such a military power to destroy, at once, all centres of civilization in the world and to affect some vital properties of the planet.

The *danger* of a nuclear holocaust is not the unavoidable consequence of the great development of pure Science.

In fact, *Science* is the study of the Fundamental Laws of Nature.

Technology is the study of how the power of mankind can be increased.

Technology can be for peace and for war. The choice between peace and war is not a scientific choice. It is a cultural one: the *culture of love* produces peaceful technology. The *culture of hatred* produces instruments of war. Love and hatred have existed forever. In the bronze and iron ages, notoriously pre-scientific, mankind invented and built tools for peace and instruments of war. In the so called "modern era" it is imperative that *culture of love* wins.

An enormous number of scientists share their time between pure Science research and military applications. This is a fundamental source for the arms race.

It is necessary that a *new trend* develops, inside the scientific community and on an international basis.

It is of vital importance to identify the basic factors needed to start an effective process to protect human life and culture from a third and unprecedented catastrophic war. To accomplish this it is necessary to change the peace movement from a unilateral action to a truly international one involving proposals based on mutual and true understanding.

- This Statement was written in ERICE, August 1982, by Paul A.M. DIRAC, Piotr KAPITZA and Antonino ZICHICHI. By now the number of signatories of the Erice Statement has exceeded ninety thousands, the world over.
- The 'Erice Statement' has attracted, in the eighties, the attention of World Leaders such as Deng Xiao Ping (China), Mikhail Gorbachev (USSR), Olof Palme (Sweden), Sandro Pertini (Italy), Ronald Reagan (USA), Pierre Trudeau (Canada) and stimulated various actions on their part for a Science without secrecy and without frontiers.

● Here are our proposals:

1. Scientists who wish to devote all of their time, fully, to study theoretically or experimentally the basic laws of Nature, should in no case suffer for this free choice, to do only pure Science.
2. All Governments should make every effort to reduce or eliminate restrictions on the free flow of information, ideas and people. Such restrictions add to suspicion and animosity in the world.
3. All Governments should make every effort to reduce secrecy in the technology of defense. The practice of secrecy generates hatred and distrust. To start a ban for military secrecy will create greater stability than offered by deterrence alone.
4. All Governments should continue their action to prevent the acquisition of nuclear weapons by additional nations or non-national groups.
5. All Governments should make every effort to reduce their nuclear weapons stockpiles.
6. All Governments should make every effort to reduce the causes of insecurity of non-nuclear powers.
7. All Governments should make every effort to ban all types of nuclear tests in war technology.

● Conclusion

Those scientists — in the East and in the West — who agree with this «Erice Statement», engage themselves morally to do everything possible in order to make the *new trend*, outlined in the present document, become effective all the world over and as soon as possible.

● Here are our proposals:

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7. All Governments should make every effort to ban all types of nuclear tests in war technology.

ISCRA 2026: 24th Course:

Particles and the Cosmos: Bridging the Infinitesimal and the Infinite

The collage features several key elements:

- Central Diagram:** A diagram illustrating the interaction of cosmic rays. A yellow beam labeled "(charged) cosmic rays" enters from the left. It splits into a red arrow labeled "e" (electron) and a blue arrow labeled "p" (proton). The electron path leads to "gamma rays" (yellow arrows). The proton path leads to "neutrinos" (orange arrows). A yellow arrow labeled " γ_{3K} " points towards a starburst labeled "GZK?". The Earth is shown at the bottom right, with arrows indicating the paths of these particles.
- Galaxy:** A large, detailed image of a spiral galaxy on the left side.
- Supernova Remnant:** A colorful, multi-colored image of a supernova remnant in the top right corner, with text: "SNR Cassiopeia", "N 1604", "Chandra X-ray Observatory", "Hubble Space Telescope", "Fermi Space Telescope".
- Space Station:** An image of the International Space Station in the middle right.
- Gravitational Well:** Three small images showing gravitational wells (black holes) in the bottom left, with labels "dark matter" and "gravitational waves".
- Particle Detector:** A large, complex particle detector structure in the bottom right, with a red and green beam of particles passing through it.
- Portraits:** Several portraits of scientists are interspersed throughout the collage, including a woman in the top left, three men in the top center, a man in the top right, a woman in the middle right, a man in the bottom left, a woman in the bottom center, and a man in the bottom right.