

«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE

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

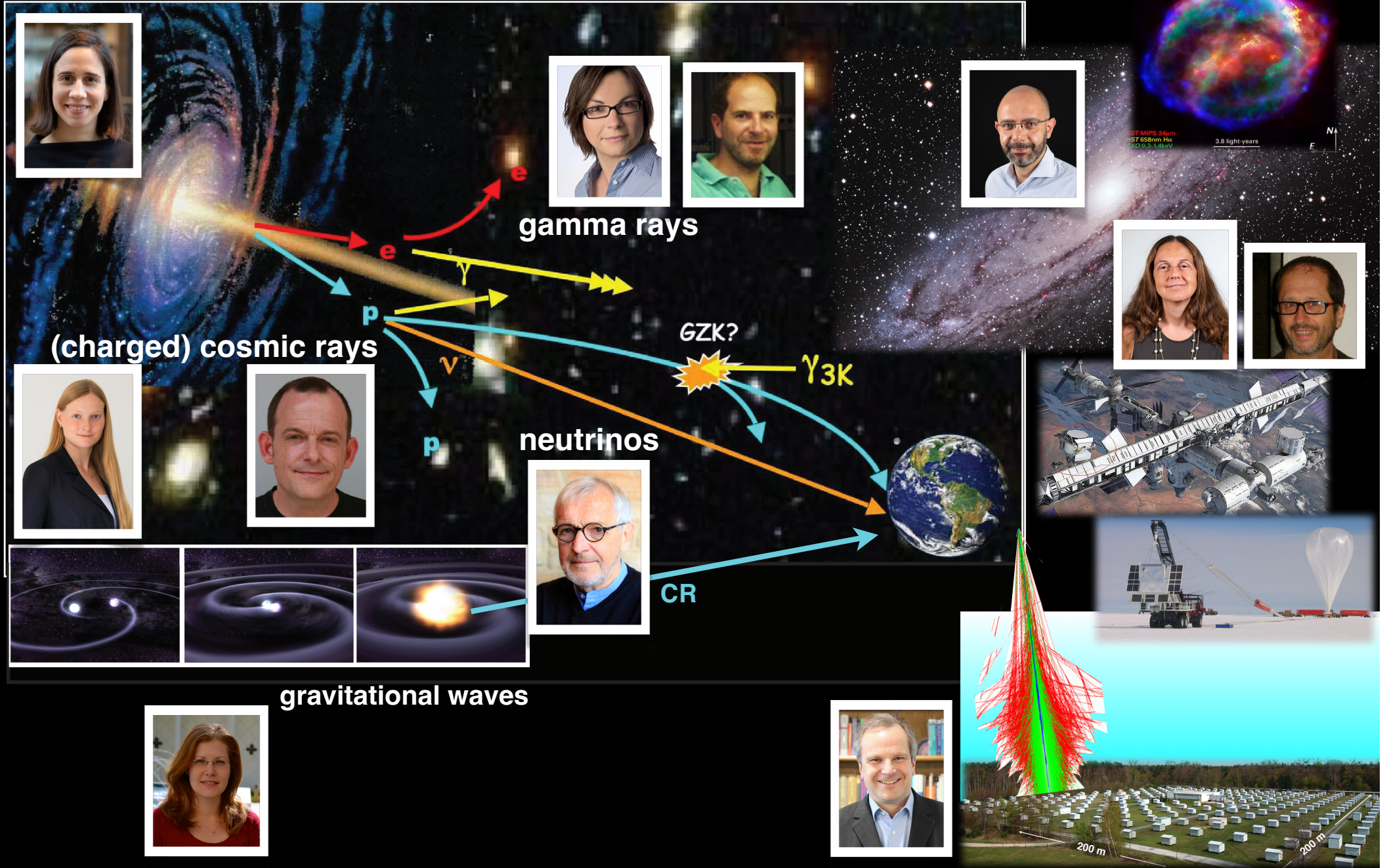
23rd Course: “Multi-Messenger Astroparticle Physics” 20 – 28 July 2024

PRESIDENT AND DIRECTOR OF THE CENTRE: PROFESSOR A. ZICHICHI

DIRECTORS OF THE COURSE: PROFESSORS J.R. HÖRANDEL, T. STANEV, R. SPARVOLI - J.P. WEFEL (director emeritus)

Closing remarks

ISCRA 2024: 23rd Course: Multi-Messenger Astroparticle Physics





«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE

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

23rd Course: “Multi-Messenger Astroparticle Physics” 20 – 28 July 2024

PRESIDENT AND DIRECTOR OF THE CENTRE: PROFESSOR A. ZICHICHI

DIRECTORS OF THE COURSE: PROFESSORS J.R. HÖRANDEL, T. STANEV, R. SPARVOLI - J.P. WEFEL (director emeritus)

Thanks to the
EMFCSC staff!
Giovanni, Fiorella, Pino,
Alessandro, and all others

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 EeV Energies - 2008 • Astro & Particle Physics: From Underground to Outer Space - 2010 • A New Era in Particle Astrophysics - 2012 • Exploring the High Energy Universe - 2014 • Particle, Gamma-ray and Neutrino Astrophysics in the 21st Century - 2016 • Astroparticle Physics: yesterday, today, and tomorrow - The 40th anniversary of the ISCRRA - 2018 • From Cosmic Particles to Gravitational Waves - now and to come - 2022



«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE

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

23rd Course: “Multi-Messenger Astroparticle Physics” 20 – 28 July 2024

PRESIDENT AND DIRECTOR OF THE CENTRE: PROFESSOR A. ZICHICHI

DIRECTORS OF THE COURSE: PROFESSORS J.R. HÖRANDEL, T. STANEV, R. SPARVOLI - J.P. WEFEL (director emeritus)

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 EeV Energies - 2008 • Astro & Particle Physics: From Underground to Outer Space - 2010 • A New Era in Particle Astrophysics - 2012 • Exploring the High Energy Universe - 2014 • Particle, Gamma-ray and Neutrino Astrophysics in the 21st Century - 2016 • Astroparticle Physics: yesterday, today, and tomorrow - The 40th anniversary of the ISCRRA - 2018 • From Cosmic Particles to Gravitational Waves - now and to come - 2022

SPONSORS



your institute/university/lab!

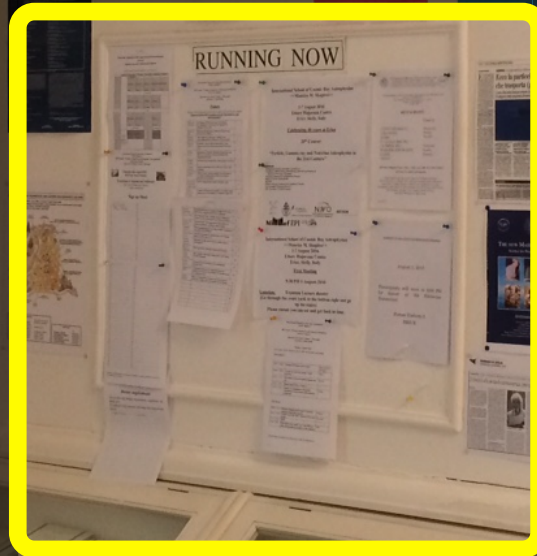
International School of Cosmic Ray Astrophysics 2024





departures

schedule will be posted on announcement board in
San Rocco



tomorrow departure day (no program)



«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE

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

23rd Course: “Multi-Messenger Astroparticle Physics” 20 – 28 July 2024

PRESIDENT AND DIRECTOR OF THE CENTRE: PROFESSOR A. ZICHICHI

DIRECTORS OF THE COURSE: PROFESSORS J.R. HÖRANDEL, T. STANEV, R. SPARVOLI - J.P. WEFEL (director emeritus)

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 EeV Energies - 2008 • Astro & Particle Physics: From Underground to Outer Space - 2010 • A New Era in Particle Astrophysics - 2012 • Exploring the High Energy Universe - 2014 • Particle, Gamma-ray and Neutrino Astrophysics in the 21st Century - 2016 • Astroparticle Physics: yesterday, today, and tomorrow - The 40th anniversary of the ISCRRA - 2018 • From Comic Particles to Gravitational Waves - now and to come - 2022

check-out for rooms in
EMFCSC buildings

please leave key in room
(on table)



«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE

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

23rd Course: “Multi-Messenger Astroparticle Physics” 20 – 28 July 2024

PRESIDENT AND DIRECTOR OF THE CENTRE: PROFESSOR A. ZICHICHI

DIRECTORS OF THE COURSE: PROFESSORS J.R. HÖRANDEL, T. STANEV, R. SPARVOLI - J.P. WEFEL (director emeritus)

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 EeV Energies - 2008 • Astro & Particle Physics: From Underground to Outer Space - 2010 • A New Era in Particle Astrophysics - 2012 • Exploring the High Energy Universe - 2014 • Particle, Gamma-ray and Neutrino Astrophysics in the 21st Century - 2016 • Astroparticle Physics: yesterday, today, and tomorrow - The 40th anniversary of the ISCRRA - 2018 • From Comic Particles to Gravitational Waves - now and to come - 2022

school dinner

today, July 27th

20:00 Hotel Elimo



school dinner

**today, July 27th
20:00 Hotel Elimo**



«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE

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

23rd Course: “Multi-Messenger Astroparticle Physics” 20 – 28 July 2024

PRESIDENT AND DIRECTOR OF THE CENTRE: PROFESSOR A. ZICHICHI

DIRECTORS OF THE COURSE: PROFESSORS J.R. HÖRANDEL, T. STANEV, R. SPARVOLI - J.P. WEFEL (director emeritus)

ISCRA poster price for 4 best posters

to be awarded during the dinner

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 EeV Energies - 2008 • Astro & Particle Physics: From Underground to Outer Space - 2010 • A New Era in Particle Astrophysics - 2012 • Exploring the High Energy Universe - 2014 • Particle, Gamma-ray and Neutrino Astrophysics in the 21st Century - 2016 • Astroparticle Physics: yesterday, today, and tomorrow - The 40th anniversary of the ISCRA - 2018 • From Cosmic Particles to Gravitational Waves - now and to come - 2022



«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE

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

23rd Course: “Multi-Messenger Astroparticle Physics” 20 – 28 July 2024

PRESIDENT AND DIRECTOR OF THE CENTRE: PROFESSOR A. ZICHICHI

DIRECTORS OF THE COURSE: PROFESSORS J.R. HÖRANDEL, T. STANEV, R. SPARVOLI - J.P. WEFEL (director emeritus)

Thanks for all lectures, student presentations, and posters as well as the good questions/discussions!

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 EeV Energies - 2008 • Astro & Particle Physics: From Underground to Outer Space - 2010 • A New Era in Particle Astrophysics - 2012 • Exploring the High Energy Universe - 2014 • Particle, Gamma-ray and Neutrino Astrophysics in the 21st Century - 2016 • Astroparticle Physics: yesterday, today, and tomorrow - The 40th anniversary of the ISCRRA - 2018 • From Cosmic Particles to Gravitational Waves - now and to come - 2022





«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE

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

23rd Course: "Multi-Messenger Astroparticle Physics" 20 – 28 July 2024

PRESIDENT AND DIRECTOR OF THE CENTRE: PROFESSOR A. ZICHICHI

DIRECTORS OF THE COURSE: PROFESSORS J.R. HÖRANDEL, T. STANEV, R. SPARVOLI - J.P. WEFEL (director emeritus)



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 EeV Energies - 2008 ● Astro & Particle Physics: From Underground to Outer Space - 2010 ● A New Era in Particle Astrophysics - 2012 ● Exploring the High Energy Universe - 2014 ● Particle, Gamma-ray and Neutrino Astrophysics in the 21st Century - 2016 ● Astroparticle Physics: yesterday, today, and tomorrow - The 40th anniversary of the ISCRRA - 2018 ● From Cosmic Particles to Gravitational Waves - now and to come - 2022