

Welcome to the International Cosmic Ray Conference (ICRC)

The Hague, The Netherlands

July 30 - August 6, 2015
The Hague, The Netherlands

**Local Organising
Committee**

Ad M. van den Berg,
Chairperson
Arjen van Rijn, Treasurer
David Berge
Gianfranco Bertone
Alexey Boyarsky
Sijbrand de Jong
Jan-Willem den Herder
Aart Heijboer
Jörg Hörandel
Paul Kooijman
Olaf Schotten
Jacco Vink
Peter Wenzel

**International Scientific
Program Committee**

Laura Baudis
Galina Bazilevskaya
Rolf Büttikofer
Jin Chang
Paschal Coyle
Elisabete de Gouveia Dal Pino
Silvia Dalla
Mirir Desai
Brenda Dingus
Fiorenza Donato
Roelf Du Troit Stauss
Lucy Fortson
Stefano Gabici
Piera Ghia
Peter Gorham

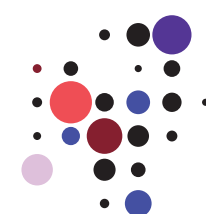
Sunil Gupta
Jim Hinton
Kara Hoffman
Dan Hooper
Per Olof Huuth
Uli Katz
Berndt Klecker
Ralfael Lang
David Laro
Olga Malandraki
Richard Marsden
Julie McEnery
Paolo Privitera
Vladimir Ptuskin
Sylvie Rosier-Lees
Masaki Mori
Roberto Ruiz de Austri
Dorothea Samtleben
Piera Sapientza

Tracy Slatyer
Pierre Sokolsky
Roberta Sparvoli
Tim Tait
Masahiro Teshima
Shoji Tori
Nick Van Eijndhoven
Scott Wakely
**IUPAP C4
Members**
Karl-Heinz Kampert, Chair
Sunil K. Gupta, Vice-chair
R. Adriaan Burger, Secretary
Masaki Mori
Jörg Hörandel
Dorothea Samtleben
Michał Ostrowski

Zhen Cao
Michael Kachelrieß
Ryan Nichol
Mikhail Panasyuk
Pasquale Blasi
Joakim Edsjö
Pierre Binétruy

**IUPAP C4
Associate Members**

Steven W. Barwick
Elisabete de Gouveia Dal Pino
Mark Lester



www.icrc2015.nl

ICRC

The Astroparticle Physics Conference
34th International Cosmic Ray Conference
July 30 - August 6, 2015
The Hague, The Netherlands



Opening & Welcome Addresses:

Ad van den Berg	Chair of the Local Organising Committee & Director of KVI-CART Groningen
Karl-Heinz Kampert	Chair of the IUPAP Commission C4
Sibrand Poppema	President of the University of Groningen

Awards & Prizes

IUPAP Young Scientist Awards (2 Awards)

Shakti Duggal Award

O'Ceallaigh Medal

Yodh Prize

IUPAP-TIFR Homi Bhabha Medal and Prize

Opening & Welcome Addresses:

Ad van den Berg

Chair of the Local Organising Committee &
Director of KVI-CART Groningen

Karl-Heinz Kampert

Chair of the IUPAP Commission C4

Sibrand Poppema

President of the University of Groningen

Opening & Welcome Addresses:

Ad van den Berg

Chair of the Local Organising Committee &
Director of KVI-CART Groningen

Karl-Heinz Kampert

Chair of the IUPAP Commission C4

Sibrand Poppema

President of the University of Groningen

International Union of Pure and Applied Physics

27 July 2015

To participants in the 34th International Cosmic Ray Conference

On behalf of the International Union of Pure and Applied Physics I welcome you to the 34th International Cosmic Ray Conference, which is held under the auspices of the IUPAP Commission C4 — the Commission on Astroparticle Physics.

One of the aims of IUPAP is to sponsor suitable international meetings and to assist organizing committees. With the dramatic developments in physics in the twenty years since IUPAP was established in 1922, in the 1940s it set up Commissions to pay closer attention to these conferences. In 1947 its Commission on Cosmic Rays, C4, was established at its first task was to organize the 1st International Cosmic Ray Conference in that year.

In coming to the 34th Conference in this series you are continuing in a major IUPAP tradition.

I wish you success and enjoyment at your conference

Sincerely



Bruce McKellar
President, IUPAP



Professor Bruce Harold John McKellar
Honorary Professorial Fellow at the
Centre of Excellence for Particle Physics at the Terascale
(CoEPP) in the School of Physics at The University of Melbourne.

International Union of Pure and Applied Physics

27 July 2015

To participants in the 34th International Cosmic Ray Conference

On behalf of the International Union of Pure and Applied Physics I welcome you to the 34th International Cosmic Ray Conference, which is held under the auspices of the IUPAP Commission C4 — the Commission on Astroparticle Physics.

One of the aims of IUPAP is to sponsor suitable international meetings and to assist organizing committees. With the dramatic developments in physics in the twenty years since IUPAP was established in 1922, in the 1940s it set up Commissions to pay closer attention to these conferences. In 1947 its Commission on Cosmic Rays, C4, was established at its first task was to organize the 1st International Cosmic Ray Conference in that year.

In coming to the 34th Conference in this series you are continuing in a major IUPAP tradition.

I wish you success and enjoyment at your conference

Sincerely

Bruce McKellar

Bruce McKellar
President, IUPAP

Btw: Holland was one of the 13 founding members!



Professor Bruce Harold John McKellar
Honorary Professorial Fellow at the
Centre of Excellence for Particle Physics at the Terascale
(CoEPP) in the School of Physics at The University of Melbourne.



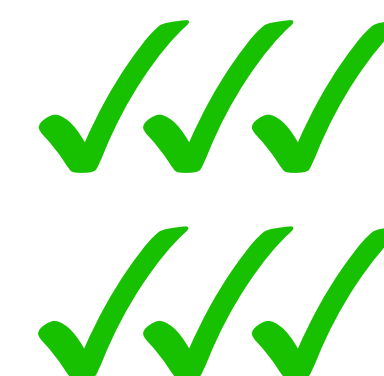
The IUPAP Mission:

- **to stimulate and promote international cooperation in physics;**
- **to foster free circulation of scientists;**
- **to foster the preparation and the publication of tables of physical constants;**
- **to promote international agreements on other use of symbols, units, nomenclature and standards;**
- **to encourage research and education;**
- **to help in the application of physics toward solving problems of concern to humanity**
- **to sponsor suitable international meetings and to assist organizing committees;**



The IUPAP Mission:

- to stimulate and promote international cooperation in physics;
- to foster free circulation of scientists;
- to foster the preparation and the publication of tables of physical constants;
- to promote international agreements on other use of symbols, units, nomenclature and standards;
- to encourage research and education;
- to help in the application of physics toward solving problems of concern to humanity
- to sponsor suitable international meetings and to assist organizing committees;



54 countries
represented



The IUPAP Mission:

- to stimulate and promote international cooperation in physics;
- to foster free circulation of scientists;
- to foster the preparation and the publication of tables of physical constants;
- to promote international agreements on other use of symbols, units, nomenclature and standards;
- to encourage research and education;
- to help in the application of physics toward solving problems of concern to humanity
- to sponsor suitable international meetings and to assist organizing committees;



54 countries
represented



- new technologies,
- detection & analysis techniques,
- “space weather”,
- win young people for science,

IUPAP Commissions

C1: Commission on Finance

C2: Commission on Symbols, Units, Nomenclature,
Atomic Masses and Fundamental Constants

C3: Statistical Physics

C4: Astroparticle Physics

C5: Low Temperature Physics

C6: Biological Physics

C8: Semiconductors

C9: Magnetism

C10: Structure and Dynamics of Condensed Matter

C11: Particles and Fields

C12: Nuclear Physics

C13: Physics for Development

C14: Physics Education

C15: Atomic, Molecular, and Optical Physics

C16: Plasma Physics

C17: Laser Physics and Photonics

C18: Mathematical Physics

C19: Astrophysics

C20: Computational Physics

IUPAP Commissions

C1: Commission on Finance

C2: Commission on Symbols, Units, Nomenclature,
Atomic Masses and Fundamental Constants

C3: Statistical Physics

C4: Astroparticle Physics

C5: Low Temperature Physics

C6: Biological Physics

C8: Semiconductors

C9: Magnetism

C10: Structure and Dynamics of Condensed Matter

C11: Particles and Fields

C12: Nuclear Physics

C13: Physics for Development

C14: Physics Education

C15: Atomic, Molecular, and Optical Physics

C16: Plasma Physics

C17: Laser Physics and Photonics

C18: Mathematical Physics

C19: Astrophysics

C20: Computational Physics

*previously known as the **Commission on Cosmic Rays***

*established by the International Union of Pure and Applied Physics in 1947
to promote the exchange of information and views among the members of
the international scientific community in the general field of
Astroparticle Physics.*

IUPAP Commissions

C1: Commission on Finance

C2: Commission on Symbols, Units, Nomenclature,
Atomic Masses and Fundamental Constants

C3: Statistical Physics

C4: Astroparticle Physics

C5: Low Temperature Physics

C6: Biological Physics

C8: Semiconductors

C9: Magnetism

C10: Structure and Dynamics of Condensed Matter

C11: Particles and Fields

C12: Nuclear Physics

C13: Physics for Development

C14: Physics Education

C15: Atomic, Molecular, and Optical Physics

C16: Plasma Physics

C17: Laser Physics and Photonics

C18: Mathematical Physics

C19: Astrophysics

C20: Computational Physics

previously known as the Commission on Cosmic Rays

established by the International Union of Pure and Applied Physics in 1947 to promote the exchange of information and views among the members of the international scientific community in the general field of Astroparticle Physics.

- * Renaming discussion started 5 years ago by request of Executive Council to National Chairs.
- * Community poll done at previous ICRC
- * Approved by IUPAP Council in 2013
- * Approved by General Assembly in 2014

Astroparticle physics is a new multidisciplinary field of research that deals with the study of particles coming from the Universe.

- cosmic rays
- gamma rays
- solar and heliospheric physics
- neutrinos
- dark matter

IUPAP Commissions & working groups

C1: Commission on Finance

C2: Commission on Symbols, Units, Nomenclature,
Atomic Masses and Fundamental Constants

C3: Statistical Physics

C4: Astroparticle Physics

C5: Low Temperature Physics

C6: Biological Physics

C8: Semiconductors

C9: Magnetism

C10: Structure and Dynamics of Condensed Matter

C11: Particles and Fields

C12: Nuclear Physics

C13: Physics for Development

C14: Physics Education

C15: Atomic, Molecular, and Optical Physics

C16: Plasma Physics

C17: Laser Physics and Photonics

C18: Mathematical Physics

C19: Astrophysics

C20: Computational Physics

AC.1. International Commission for Optics

AC.2. International Commission on General Relativity and
Gravitation

AC.3. International Commission for Acoustics

AC.4. International Commission on Medical Physics

WG.1: International Committee for Future Accelerators

WG.2: Communication in Physics

WG.5: Women in Physics

WG.7: International Committee on Ultrahigh Intensity Lasers

WG.9: International Cooperation in Nuclear Physics (ICNP)

**WG 10: Astroparticle Physics International Committee
(ApPIC)**

WG 11: Gravitational Wave International Committee (GWIC)

WG 12: Energy



C4 Science Topics

To promote the exchange of information and views among the members of the international scientific community in the general field of Cosmic Ray Physics including:

- the nature and characteristics of the electromagnetic, particle and other radiation present in the cosmos;
- the theory and models concerning the origin of this radiation;
- non-accelerator high energy physics;
- the specialized technologies necessary in the field and their application.

IUPAP C4 Commission (2014-2017) (Int. Advisory Committee for ICRC)

Karl-Heinz Kampert (chair)
Sunil K Gupta (co-chair)
Adri Burger (secretary)

Pierre Binetruy
Pasquale Blasi
Zhen Cao
Joakim Edsjö
Jörg Hörandel
Michael Kachelriess
Masaki Mori
Ryan Nichol
Michal Ostrowski
Mikhail Panasyuk
Eun-Suk Seo

Associate and Inter Union Members:

Elisabete de Gouveia Dal Pino
Mark Lester
Steve Barwick
Ilya Usoskin
Albert de Roeck
Laura Baudis

The ICRC is the main conference organised and supported by C4

further international conferences with C4 support:

TAUP, COSPAR, ISVHECRI, TEVPA, ...

topics: cosmic rays, gamma rays, neutrinos, solar&heliosphere,
dark matter, underground experiments, ...

The ICRC is the main conference organised and supported by C4

further international conferences with C4 support:
TAUP, COSPAR, ISVHECRI, TEVPA, ...

topics: cosmic rays, gamma rays, neutrinos, solar&heliosphere,
dark matter, underground experiments, ...

Proceedings to all previous ICRCs will be available electronically on ADS, soon,
see http://ads.harvard.edu/pubs/icrc_status.html
thanks to efforts of C4 and friends

ICRC The Astroparticle Physics Conference



Local Organising Committee
 Ad M. van den Berg, Chairperson
 Arjen van Rijn, Treasurer
 David Berge
 Gianfranco Bertone
 Alexey Boyarsky
 Sigvard de Jager
 Jan-Willem den Harder
 Karl Heidegger
 Jörg Hörandel
 Paul Koudman
 Olf Schott
 Jacco Vink
 Peter Weibel

International Scientific Program Committee
 Laura Baudis
 Galina Bazilevskaya
 Paul Bökeler
 Jin Chang
 Paschal Corlie
 Elisabete de Gouveia Dal Pino
 Silvia Datta
 Mihir Desai
 Brenda Dingus
 Florence Donato
 Roel Du Toit Staats
 Lucy Fortson
 Masaki Fukushima
 Stefano Galucci
 Piero Ghia
 Peter Gorham

Sunil Gupta
 Jim Heitman
 Kara Hoffman
 Dan Hooper
 Per Ole Huth
 Ulf Kott
 Berndt Klecker
 Rafael Lang
 David Laro
 Olga Malasusk
 Richard Marsden
 Julia McInerney
 Paolo Privitera
 Vladimir Plavin
 Sylvia Foster Lees
 Gavin Rowell
 Roberto Ruiz de Austri
 Dorothea Samtleben
 Piero Scapone

Tracy Slatyer
 Ramona Stodoly
 Roberto Spannoli
 Tim Tait
 Masahiro Teshima
 Shih-Tsun
 Nick Van Eijndhoven
 Scott Winkley

ICRC C4 Members
 Karl-Heinz Kampert, Chair
 Sunil K. Gupta, Vice-chair
 R. Adriani, Budget Secretary
 Masaki Mori
 Jörg Hörandel
 Eun-Suk Seo
 Michael Ostrowski

Zhen Cao
 Michael Kachelrieß
 Ryan Nichol
 Mikhail Pskovskiy
 Pasquale Blasi
 Joaquim Escabi
 Pierre Binétruy

ICRC C4 Associate Members
 Steven W. Barwick
 Elisabete de Gouveia Dal Pino
 Mark Lester

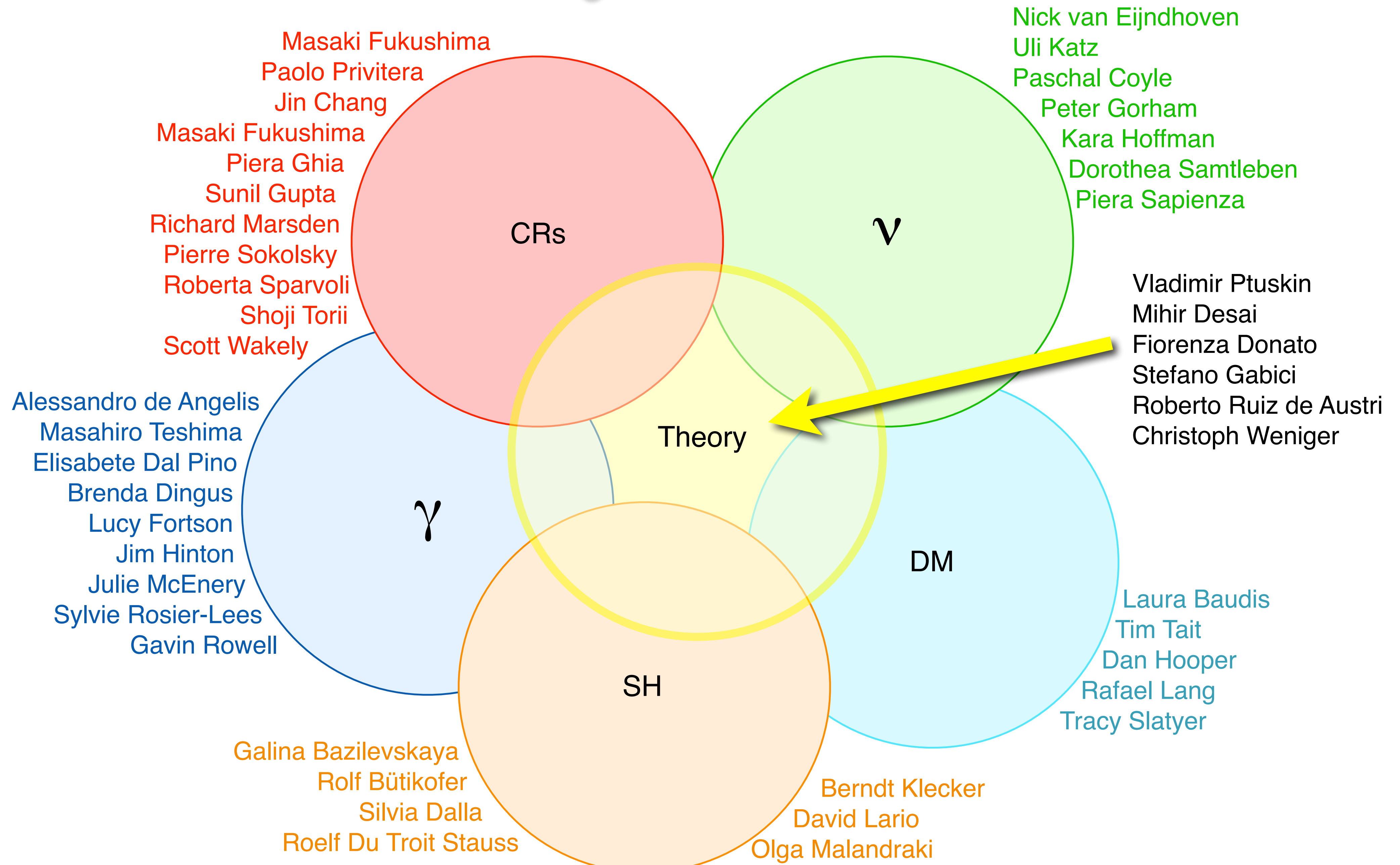
ICRC
 The Astroparticle Physics Conference
 34th International Cosmic Ray Conference
 July 30 - August 6, 2015
 The Hague, The Netherlands

www.icrc2015.nl

- 1340 abstracts received
- 385 talks (~32% of abstracts)
- 800 posters
- five parallel sessions,
time per talk remained at 12+3

– external **Scientific Program Committee**
 again to suggest plenary & highlight topics and
 speakers, select orals / posters,
 set topical accents

International Scientific Program Committee



Local Organizing Committee:

Ad van den Berg

(chair; KVI-CART University Groningen)

Arjen van Rijn, Treasurer

(National Institute for Subatomic Physics)

David Berge

(University of Amsterdam/Nikhef)

Gianfranco Bertone

(University of Amsterdam)

Alexey Boyarsky

(Leiden University)

Sijbrand de Jong

(Radboud University Nijmegen/Nikhef)

Jan-Willem den Herder

(Netherlands Institute for Space Research)

Aart Heijboer

(Nikhef)

Jörg Hörandel

(Radboud University Nijmegen/Nikhef)

Paul Kooijman

(University of Amsterdam/Nikhef)

Olaf Scholten

(University of Groningen)

Jacco Vink

(University of Amsterdam)

Christoph Weniger

(University of Amsterdam/Nikhef)

Peter Wenzel

(European Space Research and Technology Centre)

Local Organizing Committee:

Ad van den Berg	(chair; KVI-CART University Groningen)
Arjen van Rijn, Treasurer	(National Institute for Subatomic Physics)
David Berge	(University of Amsterdam/Nikhef)
Gianfranco Bertone	(University of Amsterdam)
Alexey Boyarsky	(Leiden University)
Sijbrand de Jong	(Radboud University Nijmegen/Nikhef)
Jan-Willem den Herder	(Netherlands Institute for Space Research)
Aart Heijboer	(Nikhef)
Jörg Hörandel	(Radboud University Nijmegen/Nikhef)
Paul Kooijman	(University of Amsterdam/Nikhef)
Olaf Scholten	(University of Groningen)
Jacco Vink	(University of Amsterdam)
Christoph Weniger	(University of Amsterdam/Nikhef)
Peter Wenzel	(European Space Research and Technology Centre)

Let's thank them for their hard work!

... and ask them for help

Opening & Welcome Addresses:

Ad van den Berg

Chair of the Local Organising Committee &
Director of KVI-CART Groningen

Karl-Heinz Kampert

Chair of the IUPAP Commission C4

Sibrand Poppema

President of the University of Groningen

Prizes and Awards 2015:

IUPAP Young Scientist Awards (2 Awards)

Shakti Duggal Award

O'Ceallaigh Medal

Yodh Prize

IUPAP-TIFR Homi Bhabha Medal and Prize

The good news:

The good news: a large number of nominations
all well-deserving candidates



The good news: a large number of nominations
all well-deserving candidates



The bad news:

The good news: a large number of nominations
all well-deserving candidates



The bad news: only one can win at a time !



IUPAP Young Scientist Award

... to recognize the research by young scientists
in a field of interest of the IUPAP C4 Commission
(max 8 yrs of research experience after PhD, excl. career interruptions).

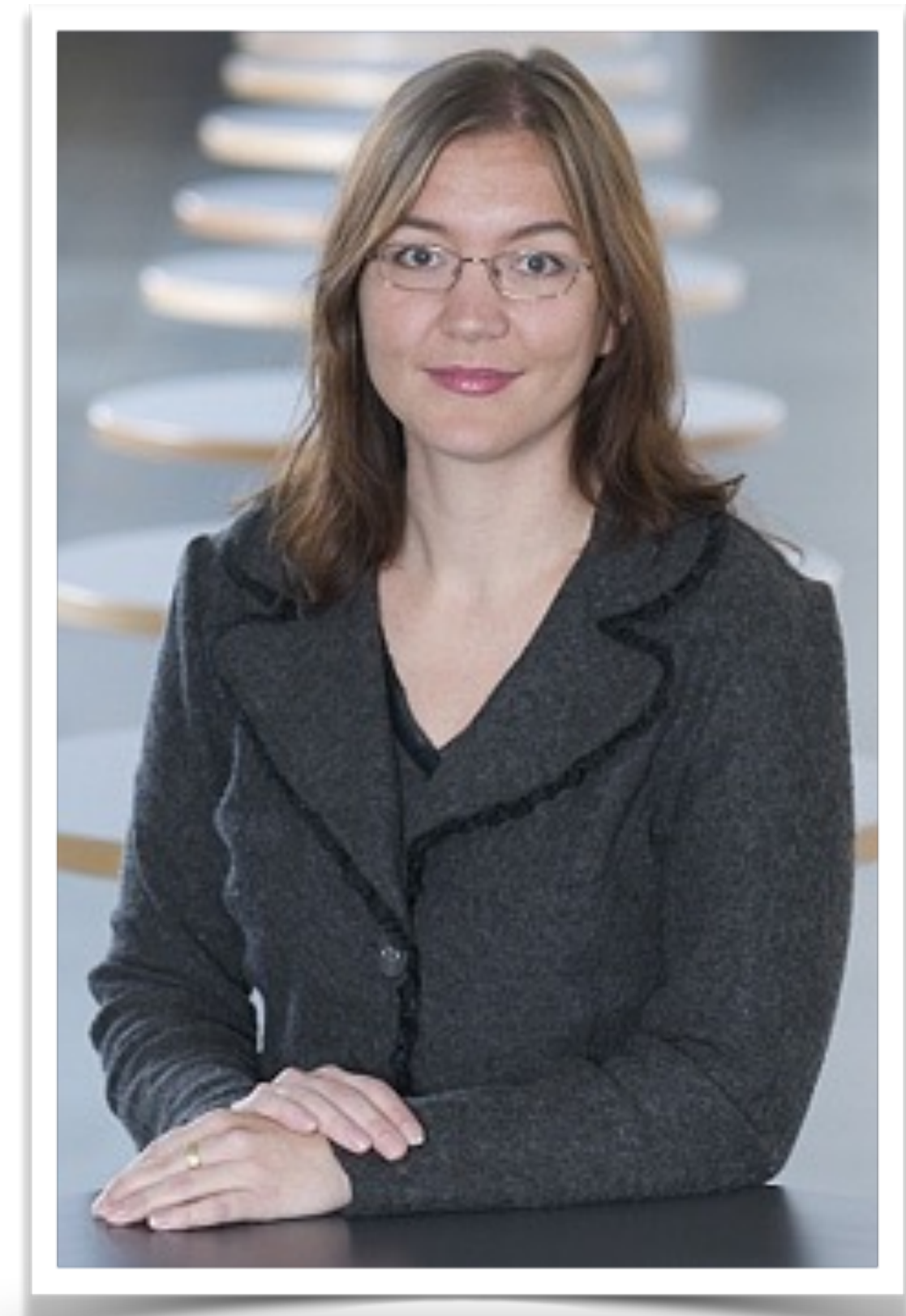
IUPAP Young Scientist Award

... to recognize the research by young scientists
in a field of interest of the IUPAP C4 Commission
(max 8 yrs of research experience after PhD, excl. career interruptions).

for: **Prof Julia Tjus, Univ. Bochum**

... for her outstanding work
connecting phenomenology and experiment
in neutrino astronomy.

Honours: Prof. Thomas K Gaisser, Bartol Research Center



IUPAP Young Scientist Award

... to recognize the research by young scientists
in a field of interest of the IUPAP C4 Commission
(max 8 yrs of research experience after PhD, excl. career interruptions).

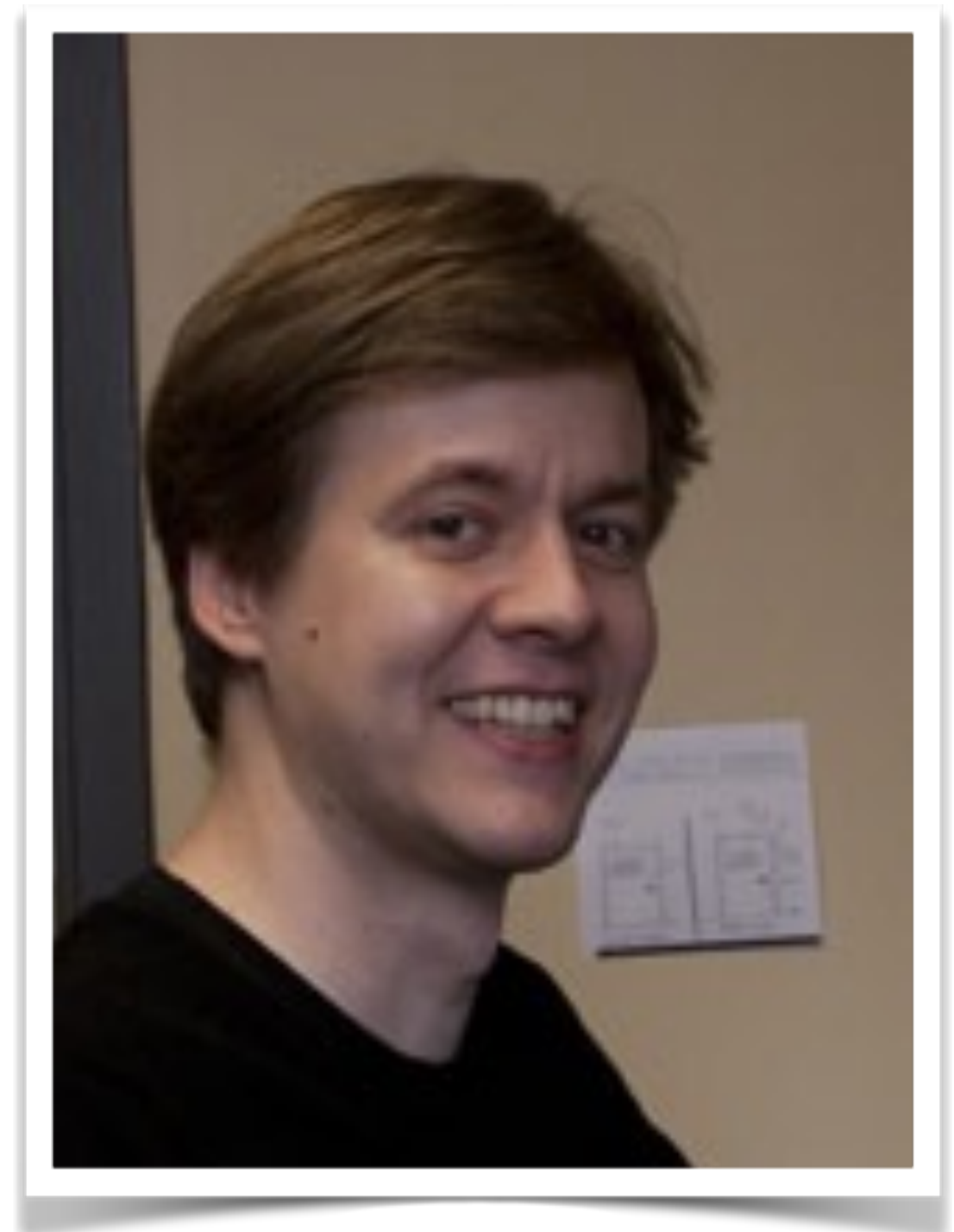
IUPAP Young Scientist Award

... to recognize the research by young scientists
in a field of interest of the IUPAP C4 Commission
(max 8 yrs of research experience after PhD, excl. career interruptions).

for: **Prof Claudio Kopper, Univ. of Alberta**

... for his outstanding contribution
to the analysis of the IceCube data, leading
to the first-ever observation of high-energy
cosmic neutrinos.

Honours: Prof Ulrich Katz, Erlangen University, ECAP



Shakti Duggal Award

... to recognize outstanding work by a young scientist in the field of Cosmic Ray Physics, including Astroparticle Physics.

Presenter: Prof Jamie Holder, Bartol Research Institute

Shakti Duggal Award

... to recognize outstanding work by a young scientist in the field of Cosmic Ray Physics, including Astroparticle Physics.

Presenter: Prof Jamie Holder, Bartol Research Institute

for: **Dr Damiano Caprioli, Princeton**

... for his outstanding contributions in the study of cosmic ray acceleration at shocks

Honours: Prof Pasquale Blasi, INAF/Arcetri Astrophysical Observatory



O'Ceallaigh Medal

... to recognise significant contributions to the field of Astroparticle Physics over an extended career

Presenter: Prof Luke O'C Drury, DIAS Dublin

O'Ceallaigh Medal

... to recognise significant contributions to the field of Astroparticle Physics over an extended career

Presenter: Prof Luke O'C Drury, DIAS Dublin

for: **Prof Jun Nishimura, Univ. of Tokyo**

... for his outstanding contributions to the 3-dim cascade theory of extensive air showers, the discovery of a constant p_{\perp} in high energy nuclear interactions, and to space based based cosmic ray experiments.

Honours: Prof Takaaki Kajita, ICRR Tokyo



Yodh Prize

... to recognize a scientist whose research career has made substantial contributions to understanding in the field of Cosmic Rays. The research should have had a major impact in the field.

Presenter & Honours: Prof Steven Barwick, UC Irvine

Yodh Prize

... to recognize a scientist whose research career has made substantial contributions to understanding in the field of Cosmic Rays. The research should have had a major impact in the field.

Presenter & Honours: Prof Steven Barwick, UC Irvine

For: **Prof Werner Hofmann, MPI-K Heidelberg**

... for his outstanding contributions to establishing TeV γ -astronomy as a new branch of Astroparticle Physics and Astronomy



Homi Bhabha Medal and Prize

... to an active scientist who has made distinguished contributions in the field of high energy cosmic ray physics and astro-particle physics over an extended academic career

Presenter: Prof Sunil Gupta, TIFR Mumbai

Homi Bhabha Medal and Prize

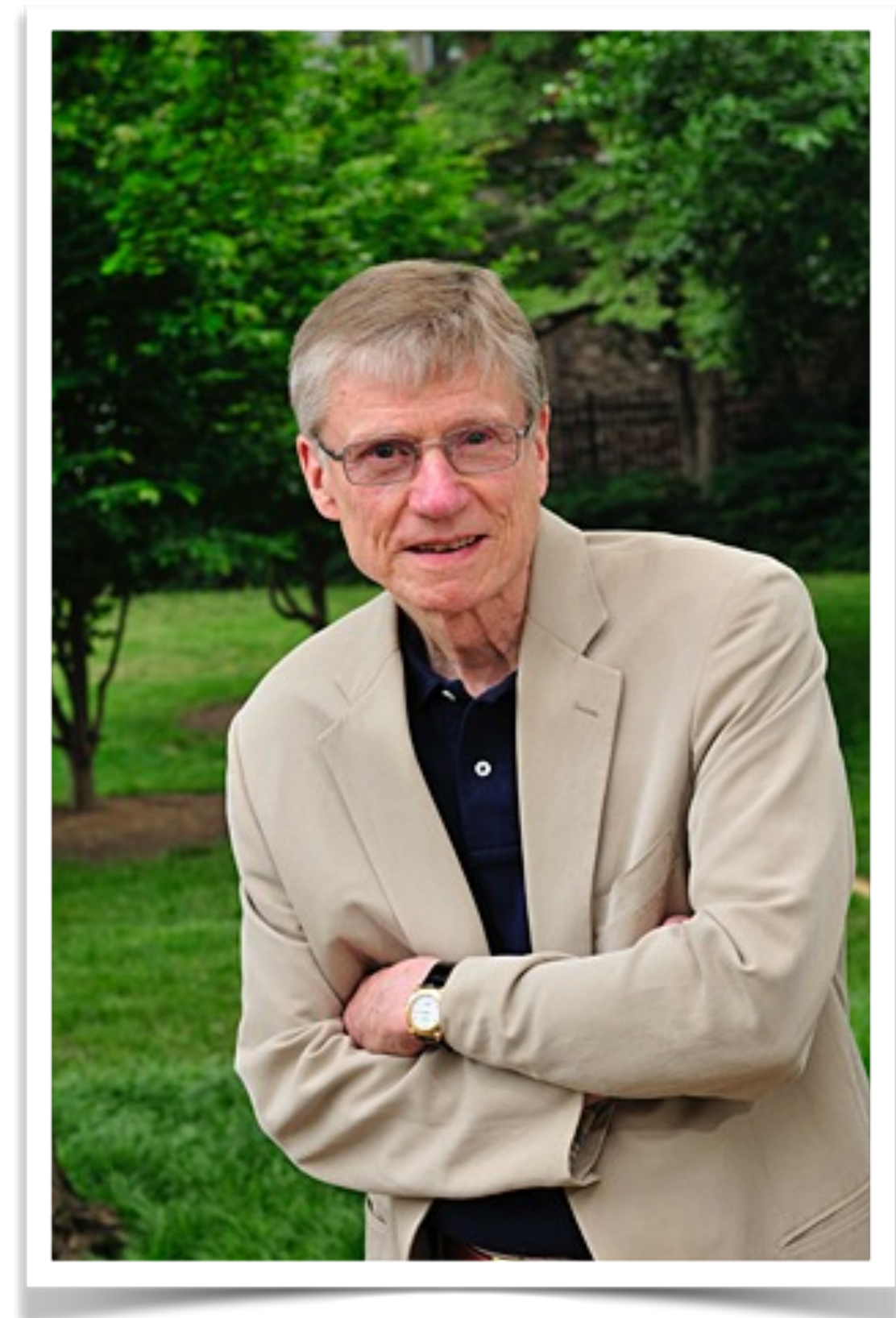
... to an active scientist who has made distinguished contributions in the field of high energy cosmic ray physics and astro-particle physics over an extended academic career

Presenter: Prof Sunil Gupta, TIFR Mumbai

for: **Prof Thomas K Gaisser,
Bartol Research Center &
Univ of Delaware**

... for a lifetime of achievement in theoretical work in cosmic ray physics and for distinguished theoretical and experimental work at the South Pole over more than 25 years.

Honours: Prof Alan A Waston, Univ Leeds



End of the opening ceremony



Time for coffee...

