

**The Symposium of
Ultra-High-Energy Gamma
Rays from Supernova
Remnants and the Origin of
Galactic Cosmic Rays**

Report of Contributions

Contribution ID: 4

Type: **Oral**

A Global Perspective on SNRs, MCs, and Gamma-ray Sources

This report investigates the associations between supernova remnants (SNRs), pulsar wind nebulae (PWNe), and molecular clouds (MCs), and their role in TeV gamma-ray emission. Based on a systematic CO survey, we reveal that a high proportion (~80%) of Galactic SNRs are associated with MCs. Separately, a statistical analysis of LHAASO TeV sources shows that PWNe and SNRs are major contributors, and that MC-associated PWNe show enhanced TeV emission with a systematic positional offset. Together, the studies establish that SNR/PWN-MC associations are prevalent in the Galaxy and are key environments for the production of very-high-energy radiation.

Primary author: ZHOU, Xin (Purple Mountain Observatory, CAS)

Presenter: ZHOU, Xin (Purple Mountain Observatory, CAS)

Session Classification: SNR in dense environments

Track Classification: Gamma-ray observations of SNRs

Contribution ID: **13**

Type: **Oral**

SNR talks

Contribution ID: **14**

Type: **not specified**

SRN obs 1

Contribution ID: 15

Type: **not specified**

Review

Contribution ID: **16**

Type: **Oral**

SNR talk 1

Contribution ID: 17

Type: **Oral**

SNR talk 1

Contribution ID: **18**

Type: **Oral**

SNR talk 1

Contribution ID: **19**

Type: **Oral**

SNR talk 1

Contribution ID: **20**

Type: **Oral**

SNR talk 1

Contribution ID: **21**

Type: **Oral**

SNR talk 1

Contribution ID: 22

Type: **Oral**

SNR talk 1

Contribution ID: 23

Type: **Oral**

SNR talk 1

Contribution ID: 24

Type: **not specified**

SNR talk1

Session Classification: SNR talks

Contribution ID: 25

Type: **not specified**

SNR talk 2

Contribution ID: 26

Type: **not specified**

SNR talk 2

Contribution ID: 27

Type: **not specified**

SNR talk 2

Contribution ID: **28**

Type: **not specified**

SNR talk 2

Contribution ID: 29

Type: **not specified**

SNR talk 2

Contribution ID: **30**

Type: **not specified**

SNR talk 2

Contribution ID: **31**

Type: **not specified**

SNR talk 2

Contribution ID: **32**

Type: **not specified**

SNR talk 1

Contribution ID: **33**

Type: **not specified**

SNR talk 1

Contribution ID: **34**

Type: **not specified**

SNR talk 1

Contribution ID: 35

Type: **not specified**

SNR talk 1

Contribution ID: **36**

Type: **not specified**

SNR talk 1

Contribution ID: 37

Type: **not specified**

SNR talk 1

Contribution ID: **38**

Type: **not specified**

SNR talk 1

Contribution ID: **50**

Type: **Oral**

SNR 1

Contribution ID: 51

Type: **Oral**

Insights from Shock-Cloud Interactions in Supernova Remnants: Implications for PeVatron Candidates

Saturday, 28 February 2026 10:30 (30 minutes)

Presenter: SANO, Hidetoshi (Gifu University)

Session Classification: SNR in dense environments

Contribution ID: 52

Type: **Oral**

Tracing Magnetic Field Variation in SNRs: An X-ray and Radio Polarimetric Comparison

Sunday, 1 March 2026 11:00 (30 minutes)

Presenter: ZHOU, Ping (Nanjing University)

Session Classification: Polarization and radio observations

Contribution ID: 53

Type: **Oral**

SNR observation 3

Session Classification: Polarization and radio observations

Contribution ID: 54

Type: **not specified**

SNR observation 4

Session Classification: Polarization and radio observations

Contribution ID: 55

Type: **Oral**

SNR radiation

Friday, 27 February 2026 09:30 (30 minutes)

Nonthermal high-energy radiation of SNRs in the
context of the origin of Galactic Cosmic Rays

Presenter: AHARONIAN, Felix (YSU/USTC/TCRRC/MPIK)

Session Classification: UHE gamma-ray astronomy and SNR radiation

Contribution ID: 56

Type: **Oral**

LHAASO cosmic ray

Presenter: ZHANG, Shoushan (Institute of High Energy Physics)

Session Classification: Cosmic ray observation & transport

Contribution ID: 57

Type: **Oral**

Particle Acceleration in SNR and the shaping of their CR source spectrum

Saturday, 28 February 2026 16:10 (30 minutes)

Presenter: BLASI, Pasquale (Gran Sasso Science Institute)

Session Classification: Theoretical perspectives on CR origin

Contribution ID: 58

Type: **not specified**

SNR acceleration review

Presenter: Prof. BLASI

Session Classification: Cosmic ray observation & transport

Contribution ID: 59

Type: **Oral**

SNRs at TeV energies with IACTs

Presenter: DE ONA WILHELMI, Emma (DESY)

Session Classification: UHE gamma-ray astronomy and SNR radiation

Contribution ID: **60**

Type: **not specified**

LHAASO observations of SNR G150.3+4.5

Friday, 27 February 2026 14:00 (30 minutes)

Presenters: XIE, Bohan; LIU, Siming (Southwest Jiaotong University)

Session Classification: SNR observation

Contribution ID: **61**

Type: **Oral**

Cas A

Presenter: ZHANG, Xiao (Nanjing Normal University)

Session Classification: SNR observation

Contribution ID: **62**

Type: **Oral**

Cas A - Molecular Cloud

Presenter: ZHOU, Ping (N)

Session Classification: SNR observation

Contribution ID: **63**

Type: **Oral**

CR Propagation

Presenter: TAYLOR, Andrew (DESY)

Session Classification: Cosmic ray observation & transport

Contribution ID: **64**

Type: **not specified**

SNR Molecular cloud

Presenter: SILVIA, Celli (Sapienza Università di Roma)

Session Classification: Cosmic ray observation & transport

Contribution ID: 65

Type: **Oral**

Evidence of cosmic-ray acceleration up to sub-PeV energies in the supernova remnant IC 443

Friday, 27 February 2026 16:50 (20 minutes)

Presenter: CHEN, Ensheng (Institute of High Energy Physics, CAS)

Session Classification: SNR Observation

Contribution ID: 66

Type: **Oral**

LHAASO observations of very-high-energy gamma-rays from SNR W44

Friday, 27 February 2026 16:00 (30 minutes)

Presenter: ZHANG, Bing Theodore (Institute of High Energy Physics, CAS)

Session Classification: SNR Observation

Contribution ID: 67

Type: **Oral**

LHAASO observation on W51C

Friday, 27 February 2026 16:30 (20 minutes)

Presenter: CHEN, Songzhan (Institute of High Energy Physics, CAS)

Session Classification: SNR Observation

Contribution ID: 68

Type: **not specified**

LHAASO Unveils PeVatron Twins in the G106.3+2.7 Region

Friday, 27 February 2026 14:30 (20 minutes)

Presenter: WU, Sha (Institute of High Energy Physics, CAS)

Session Classification: SNR observation

Contribution ID: **69**

Type: **not specified**

HAWC results on SNRs

Presenter: Prof. CASANOVA, sabrina

Session Classification: UHE gamma-ray astronomy and SNR radiation

Contribution ID: 70

Type: **Oral**

SNR Magic

Presenter: MIRZOYAN, Razmik (Max-Planck-Institute for Physics)

Session Classification: UHE gamma-ray astronomy and SNR radiation

Contribution ID: 72

Type: **Oral**

LHAASO observations of SNR Gamma Cygni

Friday, 27 February 2026 14:50 (20 minutes)

Presenter: ZENG, Houdun (PMO)

Session Classification: SNR observation

Contribution ID: 73

Type: **Oral**

LHAASO observations of SNR Cassiopeia A

Friday, 27 February 2026 15:10 (20 minutes)

Presenter: YANG, Ruizhi (USTC)

Session Classification: SNR observation

Contribution ID: 74

Type: **Oral**

Broadband spectrum of Cas A and its CR production

Saturday, 28 February 2026 15:00 (20 minutes)

Presenter: LI, Zhuo (Peking University)

Session Classification: Theoretical perspectives on CR origin

Contribution ID: 75

Type: **Oral**

CR Spectrum and SNRs as CR Origins

Friday, 27 February 2026 09:00 (30 minutes)

Presenter: CAO, Zhen (Institute of High Energy Physics, CAS)

Session Classification: UHE gamma-ray astronomy and SNR radiation

Contribution ID: 76

Type: **Oral**

SNR at TeV energies with IACTs

Friday, 27 February 2026 10:30 (30 minutes)

Presenter: DE ONA WILHELMI, Emma (DESY)

Session Classification: SNR detection in VHE-UHE band

Contribution ID: 77

Type: **Oral**

Selected Results of MAGIC Measurements of SNR and CR

Friday, 27 February 2026 11:00 (30 minutes)

Presenter: MIRZOYAN, Razmik (Max-Planck Institute for Physics)

Session Classification: SNR detection in VHE-UHE band

Contribution ID: 78

Type: **Oral**

HAWC results on SNRs

Friday, 27 February 2026 11:30 (30 minutes)

Presenter: CASANOVA, Sabrina (University of Krakow)

Session Classification: SNR detection in VHE-UHE band

Contribution ID: 79

Type: **Oral**

Pulsar wind nebula

Sunday, 1 March 2026 09:30 (20 minutes)

Presenter: LIU, Ruoyu (Nanjing University)

Session Classification: Beyond SNRs

Contribution ID: **80**

Type: **Oral**

Stellar clusters and young stellar objects

Sunday, 1 March 2026 09:50 (20 minutes)

Presenter: YANG, Ruizhi (USTC)

Session Classification: Beyond SNRs

Contribution ID: **81**

Type: **Oral**

Detection of Microquasars at ultra-high energies by LHAASO

Sunday, 1 March 2026 10:10 (20 minutes)

Presenter: LI, Cong (Institute of High Energy Physics, CAS)

Session Classification: Beyond SNRs

Contribution ID: 82

Type: **Oral**

Magnetized Relativistic Pulsar Winds in Supernova Remnants

Saturday, 28 February 2026 14:30 (30 minutes)

Presenter: LOU, Yuqing (Tsinghua University)

Session Classification: Theoretical perspectives on CR origin

Contribution ID: 83

Type: **Oral**

Recent LHAASO Results on Cosmic-Ray Proton and Helium Spectra and Future Prospects

Saturday, 28 February 2026 09:00 (30 minutes)

Presenter: ZHANG, Shoushan (Institute of High Energy Physics, CAS)

Session Classification: Cosmic ray observation & transport

Contribution ID: 84

Type: **Oral**

The Imprint of a Giant Magnetised Halo on Arriving Extragalactic Cosmic Rays

Saturday, 28 February 2026 09:30 (30 minutes)

Presenter: TAYLOR, Andrew (DESY)

Session Classification: Cosmic ray observation & transport

Contribution ID: 85

Type: **Oral**

Particle escape from SNRs

Saturday, 28 February 2026 14:00 (30 minutes)

Presenter: SILVIA, Celli (Sapienza Università di Roma)

Session Classification: Theoretical perspectives on CR origin

Contribution ID: 86

Type: **Oral**

A Global Perspective on SNRs, MCs, and Gamma-ray Sources

Saturday, 28 February 2026 11:00 (30 minutes)

Presenter: ZHOU, Xin (Purple Mountain Observatory, CAS)

Session Classification: SNR in dense environments

Contribution ID: 87

Type: **Oral**

Supernova Remnants as the Main Sources of Galactic Cosmic Rays: Insights from Spectral Features

Saturday, 28 February 2026 16:40 (30 minutes)

Presenter: RECCHIA, Sarah (Institute of Nuclear Physics Polish Academy of Sciences)

Session Classification: Theoretical perspectives on CR origin

Contribution ID: 88

Type: **Oral**

The impact of in-source production of boron on the B/C ratio in cosmic rays

Saturday, 28 February 2026 15:20 (20 minutes)

Presenter: JIANG, Qiqi (Deutsches Elektronen-Synchrotron (DESY))

Session Classification: Theoretical perspectives on CR origin

Contribution ID: **89**

Type: **Oral**

Cosmic Ray Transport in the Giant Milky Way Halo

Saturday, 28 February 2026 17:10 (20 minutes)

Presenter: LI, Chaoming (DESY)

Session Classification: Theoretical perspectives on CR origin

Contribution ID: 90

Type: **not specified**

Possible UHE Emission Stemming from the Vicinity of Pulsar Light Cylinder

Saturday, 28 February 2026 17:30 (20 minutes)

Presenter: GONG, Biping (Huazhong University of Science and Technology)

Session Classification: Theoretical perspectives on CR origin

Contribution ID: 91

Type: **Oral**

Radio observations of supernova remnants

Sunday, 1 March 2026 11:30 (30 minutes)

Presenter: SUN, Xiaohui (Yunnan University)

Session Classification: Polarization and radio observations

Contribution ID: 92

Type: **Oral**

Probing low-energy cosmic rays from SNR with MeV nuclear de-excitation lines

Sunday, 1 March 2026 14:00 (30 minutes)

Presenter: LIU, Bing (University of Science and Technology of China)

Session Classification: Multi-wavelength with future facilities

Contribution ID: 93

Type: **Oral**

PeVatrons with the ASTRI Mini-Array

Sunday, 1 March 2026 14:30 (20 minutes)

Presenter: GIULIANI, Andrea (INAF / IASF Milano)

Session Classification: Multi-wavelength with future facilities

Contribution ID: 94

Type: **Oral**

LHAASO Observations of supernova remnants G35.6-0.4 and CTB 87

Sunday, 1 March 2026 09:00 (30 minutes)

Presenter: ZHANG, Xiao (Nanjing Normal University)

Session Classification: Beyond SNRs

Contribution ID: 95

Type: **Oral**

Possible Origin of the Extended Gamma Rays Around SNR Kes 78

Friday, 27 February 2026 17:10 (20 minutes)

Presenter: SHEN, Yunzhi (Nanjing University)

Session Classification: SNR Observation

Contribution ID: 96

Type: **Oral**

LHAASO Observations of SNR G69.7+1.0

Friday, 27 February 2026 17:30 (20 minutes)

Presenter: XI, Shaoqiang (Institute of High Energy Physics, CAS)

Session Classification: SNR Observation

Contribution ID: 97

Type: **Oral**

Molecular Clouds in Cas A

Saturday, 28 February 2026 11:30 (30 minutes)

Presenter: ZHOU, Ping (Nanjing University)

Session Classification: SNR in dense environments

Contribution ID: 98

Type: **not specified**

Study of CR acceleration at SNR gamma-Cygni with X-ray (Remote)

Sunday, 1 March 2026 15:10 (20 minutes)

Presenter: ZHANG, Heshou (INAF –Osservatorio Astronomico di Brera)

Session Classification: Multi-wavelength with future facilities

Contribution ID: 99

Type: **Oral**

Progress in LACT and Future Plans

Sunday, 1 March 2026 14:50 (20 minutes)

Presenter: ZHANG, Shoushan (Institute of High Energy Physics)

Session Classification: Multi-wavelength with future facilities