The NIC-IX Program

Sunday, June 25

17:00 – 20:00  Registration  location: CERN Restaurant #1

Monday, June 26

8:30 – Registration (continue)

9:00  Introduction & Welcome  location: CERN Main Auditorium
      chair: A Mengoni

Welcome
J Engelen, CERN CSO
In memory of Al Cameron
J Cowan, U Oklahoma
In memory of John Bahcall and Ray Davis
P Parker, Yale U

1  Stars: observations, evolution & nucleosynthesis
   chair: M Wiescher

9:30  Nuclear astrophysics with gamma-ray line observations
      R Diehl,  MPE Garching
10:00 From massive stars to supernovae
      A Heger,  Los Alamos/UC St Cruz
10:30 The rp-process and X-ray bursts
      H Schatz,  MSU

11:00 break

2  Experiments in nuclear astrophysics I
   chair: A Shotter

11:45 Underground nuclear astrophysics
       H Costantini,  U Genova/U Notre Dame
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
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<tbody>
<tr>
<td>12:15</td>
<td>The $^{26}_{\text{g}}\text{Al}(p,\gamma)^{27}\text{Si}$ reaction in Novae</td>
<td>C Ruiz, TRIUMF</td>
</tr>
<tr>
<td>12:35</td>
<td>Direct measurement of the $^{18}_{\text{F}}(p,\alpha)^{15}\text{O}$ reaction for application to nova gamma-ray emission</td>
<td>N de Sereville, Louvain-la-Neuve</td>
</tr>
<tr>
<td>12:55</td>
<td>Measuring difficult reaction rates involving radioactive beams: A new approach</td>
<td>J D'Auria or TBA, CERN/Simon Fraser U</td>
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<td>lunch break</td>
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<td>13:15</td>
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<td>15:40</td>
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<tr>
<td>16:10</td>
<td>break &amp; poster session 18</td>
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<tr>
<td>17:10</td>
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<td>17:40</td>
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<td>18:00</td>
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<tr>
<td>18:30</td>
<td>Conference photo</td>
<td>location: lawn in front of Restaurant #1</td>
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<tr>
<td>19:00</td>
<td>Reception</td>
<td>location: CERN Globe of Innovation</td>
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# The NIC-IX Program

## Tuesday, June 27

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<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>8:30</td>
<td>r-process enhanced metal-poor stars</td>
<td>J Cowan, U Oklahoma</td>
</tr>
<tr>
<td>9:00</td>
<td>The first nova explosions</td>
<td>J José, IEEC Barcelona</td>
</tr>
<tr>
<td>9:20</td>
<td>Mass loss at very low metallicity: impacts on nucleosynthesis and GRB progenitors</td>
<td>G Meynet, U Geneva</td>
</tr>
<tr>
<td>9:40</td>
<td>Chemical compositions of neutron-process elements from near UV-observations of low-metallicity stars</td>
<td>I Ivans, Carnegie/Princeton</td>
</tr>
<tr>
<td>10:10</td>
<td>The frequency of Carbon-enhanced stars in HERES and SDSS</td>
<td>T Beers, MSU</td>
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<tr>
<td>10:30</td>
<td>break &amp; poster session 19</td>
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## 6 Evidence of nucleosynthesis in stars and presolar grains

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<tr>
<th>Time</th>
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<th>Speaker(s)</th>
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</thead>
<tbody>
<tr>
<td>11:30</td>
<td>Heavy elements in presolar grains: constraints on conditions in asymptotic giant branch stars</td>
<td>A Davis, U Chicago</td>
</tr>
<tr>
<td>12:00</td>
<td>On the stellar sources of presolar graphite in primitive meteorites</td>
<td>E Zinner, Washington U</td>
</tr>
<tr>
<td>12:20</td>
<td>Isotopic composition of presolar spinel grain OC2: Constraining intermediate-mass asymptotic giant branch models</td>
<td>M Lugaro, U Utrecht</td>
</tr>
<tr>
<td>12:40</td>
<td>(^{22})Ne a primary source of neutron for the s-process and a major neutron poison in CEMP AGB stars</td>
<td>R Gallino, U Torino/INFN Torino</td>
</tr>
<tr>
<td>Time</td>
<td>Session Title</td>
<td>Speaker</td>
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<tr>
<td>13:00</td>
<td>Accelerator mass spectrometry and nuclear astrophysics</td>
<td>G Korschinek</td>
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<tr>
<td>13:30</td>
<td>Lunch break</td>
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<tr>
<td>14:30</td>
<td>Experiments in nuclear astrophysics: indirect methods</td>
<td>Chair: C Spitaleri</td>
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<tr>
<td>14:30</td>
<td>Indirect techniques in nuclear astrophysics - ANCs and THM</td>
<td>R Tribble</td>
</tr>
<tr>
<td>15:00</td>
<td>Reaction rate of $^{15}\text{O}(\alpha,\gamma)^{19}\text{Ne}$ via indirect measurements</td>
<td>W Tan</td>
</tr>
<tr>
<td>15:20</td>
<td>Study of astrophysically important resonant states in $^{26}\text{Si}$ by the $^{28}\text{Si}(^{6}\text{He},^{6}\text{He})^{26}\text{Si}$ reaction</td>
<td>YK Kwon</td>
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<tr>
<td>15:40</td>
<td>Influences on the triple alpha process beyond the Hoyle state</td>
<td>C Diget</td>
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<tr>
<td>16:00</td>
<td>Experimental determination of reaction rates via Coulomb dissociation</td>
<td>T Motobayashi</td>
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<tr>
<td>16:30</td>
<td>Break</td>
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<tr>
<td>17:00</td>
<td>Experiments in nuclear astrophysics II</td>
<td>Chair: Y Nagai</td>
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<tr>
<td>17:00</td>
<td>Weak decay of highly charged ions</td>
<td>F Bosch</td>
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<tr>
<td>17:30</td>
<td>Alpha-induced reactions in stellar burning</td>
<td>J Görres</td>
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<tr>
<td>18:00</td>
<td>Measuring $^{12}\text{C}(\alpha,\gamma)^{16}\text{O}$ with ERNA</td>
<td>D Schürmann</td>
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<tr>
<td></td>
<td>Measurement of the cascade cross section to the 6.049-MeV state in $^{16}\text{O}$ in $^{12}\text{C}(\alpha,\gamma)^{16}\text{O}$</td>
<td>C Matei</td>
</tr>
<tr>
<td>18:30</td>
<td>The supernova-nucleosynthesis $^{40}\text{Ca}(\alpha,\gamma)^{44}\text{Ti}$ reaction</td>
<td>M Paul</td>
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<td></td>
<td>Study of the $^{40}\text{Ca}(\alpha,\gamma)^{44}\text{Ti}$ reaction at stellar temperatures with DRAGON</td>
<td>C Vockenhuber</td>
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<tr>
<td>19:00</td>
<td>Big Poster-Session &amp; Beer [all posters]</td>
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<tr>
<td>Time</td>
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<td>9</td>
<td>Element production, stellar evolution, and stellar explosions</td>
<td>chair: V Smith</td>
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<tr>
<td>8:30</td>
<td>New ideas in the theory of core-collapse supernova explosions</td>
<td>A Burrows, UA Tucson</td>
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<tr>
<td>9:00</td>
<td>The role of neutrinos in explosive nucleosynthesis</td>
<td>C Fröhlich, U Basel</td>
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<tr>
<td>9:20</td>
<td>Neutrinos and nucleosynthesis in gamma ray bursts</td>
<td>R Surman, Union College New York</td>
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<tr>
<td>9:40</td>
<td>Presupernova evolution and explosive nucleosynthesis of massive stars</td>
<td>A Chieffi, INAF Rome</td>
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<tr>
<td>10:10</td>
<td>break &amp; poster session 20</td>
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<tr>
<td>10</td>
<td>Element production &amp; stellar evolution II</td>
<td>chair: R Hoffman</td>
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<tr>
<td>11:00</td>
<td>Globular clusters: Ideal laboratories to test nucleosynthesis and hydrodynamics in low- and intermediate mass stars?</td>
<td>C Charbonnel, U Geneva</td>
</tr>
<tr>
<td>11:30</td>
<td>Neutron-capture elements in globular cluster M15</td>
<td>K Otsuki, U Chicago</td>
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<tr>
<td>11:50</td>
<td>Chemical evolution of C-Zn and r-process elements produced by the first generation stars</td>
<td>Y Ishimaru, Kogakuin Tokyo</td>
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<tr>
<td>12:10</td>
<td>Reaction rate uncertainties and the operation of the NeNa and MgAl chains during HBB</td>
<td>R Izzard, U Utrecht</td>
</tr>
<tr>
<td>12:30</td>
<td>The new solar chemical composition: does the Sun have a sub-solar metallicity?</td>
<td>M Asplund, ANU Canberra</td>
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<tr>
<td>13:00</td>
<td>lunch break</td>
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<tr>
<td>14:00</td>
<td>Excursions</td>
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<tr>
<td>19:30</td>
<td>(approx) back at CERN site</td>
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The NIC-IX Program

Thursday, June 29

11  Nuclear theory in astrophysics  
    chair: F-K Thielemann

  8:30  Direct reactions in/for astrophysics  
        C Bertulani,  UA Tucson

  9:00  Cross sections of light-ion reactions calculated from ab initio wave functions  
        C Forssén,  LLNL Livermore

  9:20  Nuclear models for light systems  
        P Descouvemont,  UL Brussels

  9:50  Modified nuclear lifetime in hot dense plasmas  
        G Gosselin,  CEA Saclay

  10:10 Enhanced electron screening in nuclear reactions and radioactive decays  
       K Czerski,  U Szczecin

10:30  break & poster session 21

12  Cosmology & BBN  
    chair: R Boyd

  11:30  Dark matter, dark energy & particle physics  
         J Ellis,  CERN

  12:00  Supernovae Ia as standard candles  
         P Garnavich,  U Notre Dame

  12:30  When stars attack! Live radioactivities as signatures of nearby supernovae  
         B Fields,  U Illinois

  12:50  Electron capture reactions in neutron star crusts: deep heating and observational constraints  
         E Brown,  MSU

  13:10  Early star formation nucleosynthesis and chemical evolution in proto-galactic clouds  
         G Mathews,  U Notre Dame
13:30 lunch break

13 Experiments in nuclear astrophysics III
chair: B Jonson

14:30 AMS measurements of stellar cross sections across the nuclear chart
A Wallner, U Vienna

14:50 Proton resonance scattering on $^7$Be
H Yamaguchi, U Tokyo

15:10 Improving the rate of the triple alpha reaction
C Tur, MSU

15:30 High-precision mass measurements for reliable nuclear astrophysics calculations
A Herlert, ISOLDE/CERN

15:50 $\alpha$-capture reactions and the $\alpha$-nucleus optical potential for p-process nucleosynthesis
S Harrisopoulos, Demokritos/Athens

17:45 departure to banquet

18:45 embarkment at «Pier Paquis», Lac Léman - Geneva
### Friday, June 30

#### 14. Experiments in nuclear astrophysics IV  
*chair: S Kubono*

- **8:30** Neutron cross sections at n_TOF  
  *M Heil, GSI Darmstadt/FZK Karlsruhe*

- **9:00** Measurements of the \((n,\gamma)\) and \((n,n')\) reaction cross sections on \(^{186,187,189}\text{Os}\) and \(^{187}\text{Re}^{187}\text{Os}\) cosmochronology  
  *M Segawa, U Osaka*

  Experimental challenges for the Re/Os clock  
  *M Mosconi, FZK Karlsruhe*

- **9:30** Electromagnetic excitations in nuclei: from photon scattering to photo dissociation  
  *A Junghans, IKH Rossendorf*

  Photodissociation as a tool for nuclear astrophysics  
  *S Müller, TU Darmstadt*

  Photodisintegration of \(^{181}\text{Ta}\) leading to the isomeric state \(^{180m}\text{Ta}\)  
  *S Goko, Konan U Kobe*

- **10:15** Neutron capture measurements on the s-process termination isotopes lead and bismuth  
  *C Domingo Pardo, U Valencia/FZK Karlsruhe*

#### 10:35 break & poster session 22

#### 15. Galactic & stellar evolution  
*chair: TBA*

- **11:30** Early galactic chemical evolution: The Milky Way in a cosmological context  
  *N Prantzos, IAP Paris*

- **12:00** Neutron-capture processes in the early Galaxy  
  *W Aoki, NAO Japan*

- **12:30** AGB stars evolution and nucleosynthesis  
  *F Herwig, Los Alamos*
13:00 lunch break

16 Evolution & evidence of nucleosynthesis in stars: AGBs
chair: R Azuma

14:00 3D hydrodynamical models of the core helium flash
J Lattanzio, Monash U

14:20 The s-process in massive stars: The Shell C-burning contribution
M Pignatari, U Torino

14:40 Light and heavy elements nucleosynthesis in low mass AGB Stars
S Cristallo, INAF, Teramo

15:00 break

17 Experiments & theory in nuclear astrophysics
chair: T Rauscher

15:30 The role of fission in r-process nucleosynthesis
A Kelic, GSI Darmstadt

16:00 Nucleosynthesis in neutrino-heated matter
G Martinez Pinedo, GSI Darmstadt

16:30 Studies of radioactive nuclei and their role in the cosmos
J Blackmon, Oak Ridge

17:00 Conclusion
chair: A Mengoni

Saturday, July 1

9:00 Visits to ATLAS and ISOLDE facilities at CERN starts
Monday, June 26, 16:10-17:10

18.01 Abundances of Mn, Co and Eu in a sample of 20 F-G disk stars: the influence of hyperfine structure splitting
DEL PELOSO, Eduardo (ID: 1)

18.02 Coherent effects in nuclear pasta matter
PEREZ GARCIA, Angeles (ID: 5)

18.03 Pre-supernova models at low metallicities
HIRSCHI, Raphael (ID: 7)

18.04 Breakup and competing processes in reactions involving weakly bound nuclei
SZANTO DE TOLEDO, Alejandro (ID: 8)

18.05 $^{18}$F($\alpha$,p)$^{21}$Ne reaction: neutron source for r-process in supernovae
LEE, Hye Young (ID: 10)

18.06 Abundance clues to the natures of the "Main" and the "Weak" r-processes
KRATZ, Karl-Ludwig; PFEIFFER, Bernd; FAROUQI, Khalil; COWAN, John, J.; SNEDEN, Chris; TRURAN, James, W. (ID: 11)

18.08 Structure of doorway states above the $K^z = (8^+), t_{1/2} \sim 2.0 \times 10^5$ yr isomer in $^{186}$Re and their impact on the accuracy of the $^{187}$Re/$^{187}$Os cosmochronometer
KONDEV, Filip G (ID: 18)

18.09 Indirect techniques in nuclear astrophysics
MUKHAMEDZHANOV, Akram Zhanov (ID: 19)

18.10 Measurement of the stellar ($n,\gamma$) cross section of $^{54}$Fe
COQUARD, Laurent (ID: 21)

18.11 First measurements of the total and partial stellar neutron cross sections to the s-process branching-point $^{79}$Se
DILLMANN, Iris (ID: 23)

18.12 Present status of the KADoNiS database
DILLMANN, Iris; PLAG, Ralf (ID: 24)

18.13 Light from the ashes: Explosion physics and nucleosynthesis from the X-ray spectra of Type Ia supernova remnants
BADENES, Carlos (ID: 25)

18.14 Lead abundance and the weak r-process in the metal-poor star K462 (M15)
HANNAWALD, Michael (ID: 27)
18.15 The production of germanium in asymptotic giant branch stars
KARAKAS, Amanda (ID: 40)

18.16 r-process nucleosynthesis in Alfven wave-driven proto-neutron star winds
SUZUKI, Takeru (ID: 41)

18.17 Excitation functions of (p,n)-reactions on $^{115}$Sn, $^{116}$Sn and $^{120}$Sn isotopes
SKAKUN, Yevgen (ID: 42)

18.18 Experimental determination of the $^{41}$Ca(n,$\alpha$)$^{38}$Ar reaction cross section as a function of the neutron energy
DE SMET, Liesbeth (ID: 43)

18.19 Towards a direct measurement of the $^{15}$O($\alpha$,$\gamma$)$^{19}$Ne cross section: a first approach using the $^{15}$O+$\alpha$ elastic scattering
ANGULO, Carmen (ID: 46)

18.20 Gravitational wave emission during the transition from rapidly differential rotating neutron stars to strange stars
YASUTAKE, Nobutoshi (ID: 47)

18.21 Can supernova neutrino nucleosynthesis constrain neutrino oscillation parameters?
YOSHIDA, Takashi (ID: 48)

18.22 r-process nucleosynthesis in a collapsar
NAGATAKI, Shigehiro (ID: 49)
Tuesday, June 27, 10:30-11:30

19.01 Non-extensive statistical effects on the nuclear equation of state and on nuclear astrophysical problems

LAVAGNO, Andrea (ID: 52)

19.02 Present-day carbon abundances from early-type stars

NIEVA, Maria Fernanda (ID: 53)

19.03 Metastability of electron-nuclear astrophysical plasmas

GERVINO, Gianpiero; LAVAGNO, Andrea (ID: 54)

19.04 Neutron capture studies with a short flight path

WALTER, Stephan (ID: 55)

19.05 Quantitative spectroscopy of Deneb

SCHILLER, Florian (ID: 56)

19.06 New experiments on neutron rich r-process Ge-Br isotopes at the NSCL/MSU

QUINN, Matthew (ID: 57)

19.07 CNO production in the first generation stars

EKSTRÖM, Sylvia (ID: 61)

19.08 Heavy element nucleosynthesis in the MHD jet explosions of core-collapse supernovae

NISHIMURA, Nobuya (ID: 63)

19.09 Photodisintegration of $^{80}$Se, $^{94}$Zr, and $^{108}$Pd as a probe of neutron capture for radioactive nuclei

UTSUNOMIYA, Hiroaki (ID: 64)

19.10 Observational constrains on the cosmology with a decaying cosmological term

NAKAMURA, Riou (ID: 65)

19.11 The s-process branching at $^{186}$Re revised

MOHR, Peter (ID: 66)

19.12 Measurement of the stellar $(n,\gamma)$ cross section of $^{182}$Hf

VOCKENHUBER, Christof (ID: 67)

19.13 Light element production in the circumstellar matter of Type Ic supernovae at low metallicity

NAKAMURA, Ko (ID: 68)

19.14 Exotic cooling on neutron stars with different surface compositions

NODA, Tsuneo (ID: 69)
19.15 Phase-transition phenomenology of frustrated nuclear matter in compact stars

NAPOLITANI, Paolo

(ID: 71)

19.16 Dielectronic recombination rates in astrophysical plasmas

QUARATI, Piero

(ID: 72)

19.17 Universality of the p process

HAYAKAWA, Takehito

(ID: 74)

19.18 Cosmic clock and thermometer for neutrino process

HAYAKAWA, Takehito

(ID: 75)

19.19 The high-resolution spectroscopy of cool extremely metal-poor carbon-rich stars

ZACS, Laimons

(ID: 76)

19.20 Extraction of resonant component from spin-polarization observables

YAMAGUCHI, Mitsutaka

(ID: 77)

19.21 Equation of state and neutrino signal from collapsing stellar cores

YUDIN, Andrey

(ID: 78)

19.22 Asymmetric collapsing supernovae explosion with rotation

MANUKOVSKIY, Konstantin

(ID: 79)

19.23 Experimental studies of shell-model basis states near $^{132}\text{Sn}$

WALTERS, William

(ID: 81)

19.24 New study of the astrophysical reaction $^{13}\text{C}(\alpha,n)^{16}\text{O}$ via the $^{13}\text{C}(^7\text{Li},t)^{17}\text{O}$ transfer reaction

PELLEGRITI, Maria Grazia; HAMMACHE, Fairouz

(ID: 82)

19.25 Measurement of $^3\text{He}(\alpha,\gamma)^7\text{Be}$ with ERNA recoil separator

DI LEVA, Antonino

(ID: 83)

19.26 First experimental constraints on the interference of 3/2+ resonances in the $^{18}\text{F}(p,\alpha)^{15}\text{O}$ reaction

CHAE, K. Y.

(ID: 84)

19.27 Nuclear superfluidity and the cooling time of neutron stars

SANDULESCU, Nicolae

(ID: 85)

19.28 Low-mass AGB stars abundance predictions with improved stellar cross sections

BISTERZO, Sara

(ID: 86)

19.29 SNRs as probes of chemical composition of interstellar medium

TELEZHINSKY, Igor; HNATYK, Bohdan; PETRUK, Oleh

(ID: 87)

19.30 Nucleosynthesis of Binary low mass zero-metallicity stars

LAU, Ho Bun Herbert

(ID: 91)

19.31 Synthesis of CNO elements in standard BBN

IOCCO, Fabio

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<th>Session</th>
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<th>Author</th>
<th>ID</th>
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<tr>
<td>19.32</td>
<td>Shell model spin and parity dependent nuclear level densities for nuclear reaction rates</td>
<td>HOROI, Mihai</td>
<td>94</td>
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<tr>
<td>19.33</td>
<td>Nucleosynthesis and mixing in rotating AGB stars at low metallicity</td>
<td>DECRESSIN, Thibault</td>
<td>95</td>
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<tr>
<td>19.34</td>
<td>The $^{25}$Al$(p,$γ$)^{26}$Si reaction rate in novae</td>
<td>BARDAYAN, Dan</td>
<td>96</td>
</tr>
<tr>
<td>19.35</td>
<td>The QSE-reduced nuclear network for supernovae nucleosynthesis</td>
<td>PARETE-KOON, Suzanne</td>
<td>97</td>
</tr>
<tr>
<td>19.36</td>
<td>Investigation of nucleosynthesis capture reactions by using $^8$Li radioactive beam transfer reactions</td>
<td>GUIMARAES, Valdir</td>
<td>100</td>
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<tr>
<td>20.01</td>
<td>Level structure of $^{19}$Ne from studies of the $^{17}$O($^3$He,n)$^{19}$Ne reaction</td>
<td>HORNISH, M.; BRUNE, C.</td>
<td>103</td>
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<tr>
<td>20.02</td>
<td>The rp-process in core-collapse supernovae</td>
<td>WANAJO, Shinya</td>
<td>105</td>
</tr>
<tr>
<td>20.03</td>
<td>The weak r-process in core-collapse supernovae</td>
<td>WANAJO, Shinya</td>
<td>106</td>
</tr>
<tr>
<td>20.04</td>
<td>Elastic scattering of $^8$B on Pb, liquid Hydrogen and liquid Helium targets and the $^7$Be(p,$\gamma$)$^8$B S-factor</td>
<td>BISHOP, Shawn</td>
<td>107</td>
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<tr>
<td>20.05</td>
<td>Low energy nuclear reaction measurements using monolithic silicon telescope</td>
<td>NISHIMURA, Shunji</td>
<td>109</td>
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<tr>
<td>20.06</td>
<td>Photonuclear reactions of light nuclei studied with high-intensity real photon beams</td>
<td>SHIMA, Tatsushi</td>
<td>110</td>
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<tr>
<td>20.07</td>
<td>Supernova physics with a low-energy beta-beam</td>
<td>MCLAUGHLIN, Gail; JACHOWICZ, Natalie</td>
<td>111</td>
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<tr>
<td>20.08</td>
<td>The detailed abundance patterns of light neutron-capture elements in very metal-poor stars</td>
<td>HONDA, Satoshi</td>
<td>112</td>
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<tr>
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