

## Table of Contents

Preface .....	xii
Organizing committee .....	xiii
Conference photograph .....	xiv
Conference participants .....	xv

### Opening Session

Light elements - one observer's historical perspective.....	3
<i>D. L. Lambert</i>	

### Session I. Production of the light elements in the first minutes of the Universe

*Chair: Suzanne Talon*

Constraints from cosmic microwave background experiments .....	17
<i>J. Dunkley (Invited Review)</i>	
Primordial nucleosynthesis: A cosmological probe.....	19
<i>G. Steigman (Invited Review)</i>	
The cosmic lithium problem and physics beyond the Standard Model .....	27
<i>K. Jedamzik (Invited Review)</i>	
Big Bang nucleosynthesis with long-lived strongly interacting relic particles .....	33
<i>M. Kusakabe, T. Kajino, T. Yoshida &amp; G. J. Mathews</i>	
Primordial nucleosynthesis in higher dimensional cosmology .....	39
<i>S. Chatterjee</i>	

### Session II. Abundances of D, $^3\text{He}$ and $^4\text{He}$ : observations

*Chairs: Robert Rood, Monica Tosi*

Measurements of Deuterium in the Milky Way .....	43
<i>K. Sembach (Invited Review)</i>	
The total deuterium abundance in the local Galactic disk: decisions and implications.....	53
<i>J. L. Linsky</i>	
What the D/O ratio tells us about the interstellar abundance of deuterium? .....	59
<i>G. Hébrard</i>	
(Un)true deuterium abundance in the Galactic disk.....	65
<i>T. Prodanovic, G. Steigman &amp; B. D. Fields</i>	
Abundances of hydrogen and helium isotopes in the Protosolar Cloud.....	71
<i>J. Geiss &amp; G. Gloeckler (Invited Review)</i>	
Measurements of $^3\text{He}$ in Galactic HII regions and planetary nebulae .....	81
<i>T. M. Bania, R. T. Rood &amp; D. S. Balser (Invited Review)</i>	

Measurements of $^4\text{He}$ in metal-poor extragalactic HII regions: The primordial helium abundance and the $\Delta Y/\Delta O$ Ratio.....	91
<i>M. Peimbert, A. Peimbert, L. Carigi &amp; V. Luridiana (Invited Review)</i>	
$^4\text{He}$ abundances: Optical versus radio recombination line measurements .....	101
<i>D. S. Balser, R. T. Rood, &amp; T. M. Bania</i>	
The primordial abundance of $^4\text{He}$ from a large sample of low-metallicity HII regions .....	107
<i>Y. I. Izotov</i>	
Uncertainties in nebular helium abundances .....	113
<i>E. D. Skillman</i>	
The quite complex “Simple Stellar Populations” of globular clusters .....	119
<i>A. Bragaglia (Invited Review)</i>	
Revisiting the helium abundance in globular clusters with multiple main sequences .....	129
<i>L. Casagrande, L. Portinari &amp; C. Flynn</i>	
Helium-rich stars in globular clusters: constraints for self-enrichment by massive stars.....	135
<i>T. Decressin, G. Meynet &amp; C. Charbonnel</i>	
What helium and lithium can tell us about CEMP stars?.....	141
<i>G. Meynet, R. Hirschi, S. Ekström, A. Maeder, C. Georgy, P. Eggenberger &amp; C. Chiappini</i>	
The Helium contribution from massive AGBs.....	147
<i>P. Ventura</i>	
Discussion A: On the abundance of deuterium in the local interstellar medium and in high-redshift systems .....	153
<i>Monica Tosi (Discussion Leader)</i>	
Discussion B: What is the $^4\text{He}$ from HII regions? What needs to be done to better understand the systematic errors? .....	163
<i>G. Ferland (Discussion Leader), Y. Izotov, A. Peimbert, M. Peimbert, R. L. Porter, E. Skillman &amp; G. Steigman</i>	
He-rich and He-poor populations in RGB stars. Results on a sample of 19 globular clusters .....	169
<i>A. Bragaglia, V. D’Orazi, R. Gratton, E. Carretta, S. Cassisi &amp; S. Lucatello</i>	
Helium abundances in inner Galaxy planetary nebulae .....	171
<i>O. Cavichia, R. D. D. Costa &amp; W. J. Maciel</i>	
Primordial helium abundance of the SMC: a view from intermediate mass stars.	173
<i>R. D. D. Costa, W. J. Maciel &amp; T. E. P. Idiart</i>	
The helium spread among the stars of 47Tuc .....	175
<i>M. Di Criscienzo</i>	
Lithium and proton-capture elements in globular clusters: the case of 47 Tucanae .....	177
<i>V. D’Orazi, S. Lucatello, R. Gratton, A. Bragaglia &amp; E. Carretta</i>	
The Galactic deuterium gradient .....	179
<i>D. Lubowich &amp; J. M. Pasachoff</i>	

Helium abundances in planetary nebulae: Nucleosynthesis and chemical evolution W. J. Maciel, R. D. D. Costa & T. E. P. Idiart	181
Chemical composition of stellar populations in Omega Centauri..... A. F. Marino, G. Piotto, R. Gratton, A. P. Milone, M. Zoccali, L. R. Bedin, S. Villanova & A. Bellini	183
On the total O/H abundance ratio in Galactic and extragalactic H II regions... A. Peimbert & M. Peimbert	185
On the origin of the helium-rich population in the peculiar globular cluster Omega Centauri ..... D. Romano, M. Tosi, M. Cignoni, F. Matteucci, E. Pancino & M. Bellazzini	187
<b>Session III. Abundances of LiBeB: observations</b>	
<i>Chairs: Beatriz Barbuy, Yuri Izotov, Paolo Molaro &amp; Francesca Primas</i>	
The light elements in the light of 3D and non-LTE effects..... M. Asplund & K. Lind ( <i>Invited Review</i> )	191
Li isotopes in metal-poor halo dwarfs: a more and more complicated story .....	201
M. Spite & F. Spite ( <i>Invited Review</i> )	
Observational signatures for depletion in the Spite plateau: solving the cosmological Li discrepancy?..... J. Meléndez, L. Casagrande, I. Ramirez, M. Asplund & W. J. Schuster	211
Convection and $^6\text{Li}$ in the atmospheres of metal-poor halo stars..... M. Steffen, R. Cayrel, P. Bonifacio, H.-G. Ludwig & E. Caffau	215
Beryllium and Boron in metal-poor halo stars .....	221
F. Primas ( <i>Invited Review</i> )	
New Beryllium results in halo stars from Keck/HIRES spectra..... A. M. Boesgaard, J. A. Rich, E. M. Levesque & B. P. Bowler	231
Boron abundances in diffuse interstellar clouds..... A. M. Ritchey, S. R. Federman, Y. Sheffer & D. L. Lambert	237
Boron abundances in the Galactic disk .....	243
K. Cunha	
Lithium in globular clusters .....	249
A. J. Korn ( <i>Invited Review</i> )	
Main sequence and sub-giant stars in the globular cluster NGC 6397: The complex evolution of the lithium abundance..... J. I. González Hernández, P. Bonifacio, E. Caffau, M. Steffen, H.-G. Ludwig, N. Behara, L. Sbordone, R. Cayrel & S. Zaggia	257
Observational signatures of lithium depletion in the metal-poor globular cluster NGC 6397 .....	263
K. Lind, F. Primas, C. Charbonnel, F. Grundahl & M. Asplund	
Lithium in a metal-poor external galaxy: Omega Centauri .....	269
P. Bonifacio, L. Monaco, L. Sbordone, S. Villanova & E. Pancino	

Lithium and beryllium in Population I dwarf stars.....	275
<i>S. Randich (Invited Review)</i>	
Lithium in stars with exoplanets .....	285
<i>G. Israelian</i>	
Light elements in stars with exoplanets .....	291
<i>N. C. Santos, E. Delgado Mena, G. Israelian, J. I. González-Hernández, M. C. Gálvez-Ortiz, M. Mayor, S. Udry, R. Rebolo, S. Sousa &amp; S. Randich (Invited Review)</i>	
Observations of Lithium in red giant stars.....	301
<i>V. V. Smith (Invited Review)</i>	
Mass loss and luminosities of S and C AGB stars with and without Li .....	311
<i>R. Guandalini, S. Palmerini, M. Busso, E. Maiorca &amp; S. Uttenthaler</i>	
Observations of light elements in massive stars.....	317
<i>A. Kaufer (Invited Review)</i>	
Lithium abundances in Bulge-like SMR stars .....	325
<i>B. Barbuy, M. Trevisan, B. Gustafsson, K. Eriksson, M. Grenon &amp; L. Pompéia</i>	
Survey for Li-rich K giants .....	327
<i>Y. Bharat Kumar &amp; B. E. Reddy</i>	
A 3D-NLTE study of the 670 nm solar lithium feature .....	329
<i>E. Caffau, H.-G. Ludwig, M. Steffen &amp; P. Bonifacio</i>	
Ultra-lithium-deficient halo stars .....	331
<i>L. M. Elliott &amp; S. G. Ryan</i>	
Li-rich giants in the Galactic Bulge. Is Li linked only to evolutionary status?....	333
<i>O. A. Gonzalez</i>	
Interstellar Lithium as a probe of the primordial abundance.....	335
<i>J. C. Howk</i>	
A very low upper limit for a Be abundance of a carbon-enhanced metal-poor star	337
<i>H. Ito, W. Aoki, S. Honda, T. C. Beers &amp; N. Tominaga</i>	
Lithium abundances in the $\alpha$ Persei Cluster .....	339
<i>S. V. Mallik, S. C. Balachandran &amp; D. L. Lambert</i>	
Lithium in other Suns: no connection between stars and planets .....	341
<i>J. Meléndez, I. Ramirez, M. Asplund &amp; P. Baumann</i>	
Li abundances and chromospheric activity of BY Dra type stars .....	343
<i>T. V. Mishenina, C. Soubiran, V. V. Kovtyukh &amp; S. I. Belik</i>	
Lithium abundances in dwarfs of intermediate age open clusters .....	345
<i>G. Pace &amp; J. Meléndez</i>	
HD 232 862: a magnetic and lithium-rich giant star .....	347
<i>A. Palacios, A. Lèbre, J. D. do Nascimento Jr, R. Konstantinova-Antova, D. Kolev, M. Aurière, P. de Laverny &amp; J. R. de Medeiros</i>	

Beryllium abundances in metal-rich stars .....	349
<i>R. C. Peterson</i>	
New results of the spectral observations of CP stars .....	351
<i>N. S. Polosukhina, A. V. Shavrina, N. A. Drake, D. O. Kudryavtsev &amp; M. A. Smirnova</i>	
The metal-poor end of the Spite plateau: gravity sensitivity of the H $\alpha$ wings fitting .....	355
<i>L. Sbordone, P. Bonifacio, E. Caffau, H.-G. Ludwig, N. Behara, J. I. Gonzalez-Hernandez, M. Steffen, R. Cayrel, B. Freytag, C. Van't Veer, P. Molaro, B. Plez, T. Sivarani, M. Spite, F. Spite, T. C. Beers, N. Christlieb, P. François &amp; V. Hill</i>	
Beryllium abundances along the evolutionary sequence of the open cluster IC 4651 .....	357
<i>R. Smiljanic, L. Pasquini, C. Charbonnel &amp; N. Lagarde</i>	
Using lithium to estimate ages for solar-type stars .....	359
<i>D. R. Soderblom</i>	
Lithium in metal-poor red giants .....	361
<i>L. Zacs &amp; A. Barzdis</i>	
<b>Session IV. Sources and sinks of light elements</b>	
<i>Chairs: Francesca Primas, David Lambert</i>	
Light elements as diagnostics on the structure and evolution of low-mass stars..	365
<i>S. Talon &amp; C. Charbonnel (Invited Review)</i>	
Rotational mixing and Lithium depletion .....	375
<i>M. H. Pinsonneault</i>	
Effects of rotation and magnetic fields on the structure and surface abundances of solar-type stars .....	381
<i>P. Eggenberger, A. Maeder &amp; G. Meynet</i>	
The light elements in a helio- asteroseismic perspective .....	387
<i>S. Vauclair (Invited Review)</i>	
Lithium factories in the Galaxy: novae and AGB stars .....	395
<i>F. D'Antona &amp; P. Ventura (Invited Review)</i>	
Lithium production by thermohaline mixing in low-mass, low-metallicity asymptotic giant branch stars .....	405
<i>R. J. Stancliffe, G. C. Angelou &amp; J. C. Lattanzio</i>	
Light elements in massive single and binary stars.....	411
<i>N. Langer, I. Brott, M. Cantiello, S. E. de Mink, R. G. Izzard &amp; S.-C. Yoon</i>	
Boron depletion in 9 to 15 M $_{\odot}$ stars with rotation .....	421
<i>U. Frischknecht, R. Hirschi, G. Meynet, S. Ekström, C. Georgy, T. Rauscher, C. Winteler &amp; F.-K. Thielemann</i>	
Li survey in giant stars: probing non-standard stellar physics .....	423
<i>N. Lagarde, C. Charbonnel, G. Jasniewicz, P. North, M. Shetrone, S. Holleck, &amp; V.V. Smith</i>	

Li and CNO isotopes from magnetically induced extra-mixing in evolved stars . . . . .	425
<i>S. Palmerini, M. Busso, R. Guandalini &amp; E. Maiorca</i>	
Lithium destruction induced by planetary accretion in solar-type stars . . . . .	427
<i>S. Théado, E. Bohuon &amp; S. Vauclair</i>	
<b>Session V. Evolution of the light elements in the Universe</b>	
<i>Chairs: David Lambert, Corinne Charbonnel</i>	
Galactic evolution of D, $^3\text{He}$ , and $^4\text{He}$ . . . . .	431
<i>D. Romano (Invited Review)</i>	
Thermohaline mixing in stars: solving the long-standing $^3\text{He}$ problem . . . . .	441
<i>C. Charbonnel &amp; N. Lagarde</i>	
Theoretical stellar $\Delta Y/\Delta O$ in the early Universe . . . . .	447
<i>S. Ekström, G. Meynet, A. Maeder, C. Chiappini, C. Georgy, &amp; R. Hirschi</i>	
Galactic evolution of $^7\text{Li}$ . . . . .	453
<i>F. Matteucci (Invited Review)</i>	
Lithium, beryllium, and boron production in core-collapse supernovae . . . . .	463
<i>K. Nakamura, T. Yoshida, T. Shigeyama &amp; T. Kajino</i>	
The search for the origin of the light nuclei Li, Be, B. . . . .	469
<i>H. Reeves (Invited Review)</i>	
Origin of cosmic rays and evolution of spallogenic nuclides Li, Be and B . . . . .	473
<i>N. Prantzos (Invited Review)</i>	
Beryllium abundances and the formation of the halo and the thick disk . . . . .	483
<i>R. Smiljanic, L. Pasquini, P. Bonifacio, D. Galli, B. Barbuy, R. Gratton &amp; S. Randich</i>	
Discussion C: The stellar yields in He-3, He-4, Li-7: main sources, observational constraints and problems . . . . .	489
<i>André Maeder (Discussion Leader)</i>	
Discussion D: Observational problems with Li, Be and B . . . . .	493
<i>P. E. Nissen (Discussion Leader)</i>	
Chemical evolution of D in the Local Disk . . . . .	499
<i>T. Tsujimoto &amp; J. Bland-Hawthorn</i>	
Author index . . . . .	503