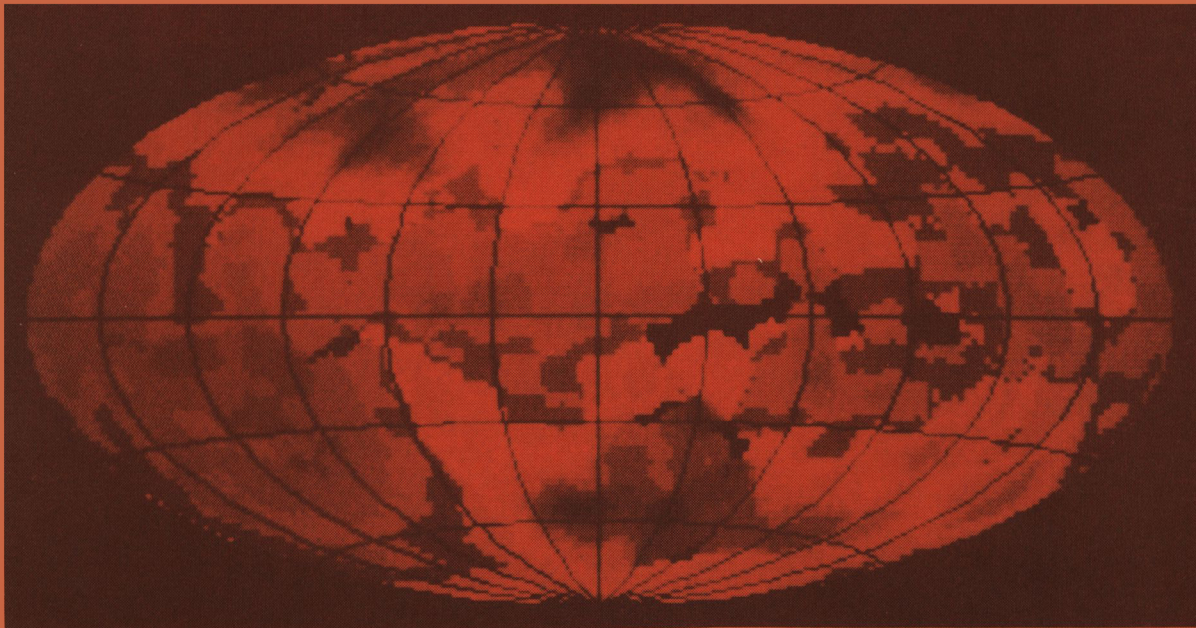


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Local Interstellar Medium

*International Astronomical
Union Colloquium Number 81*



*Proceedings of a colloquium held at
The University of Wisconsin
Madison, Wisconsin
June 4-6, 1984*

NASA

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*Edited by
Y. Kondo
NASA Goddard Space Flight Center
Greenbelt, Maryland*

*F. C. Bruhweiler
The Catholic University of America
Washington, D.C.*

*B. D. Savage
The University of Wisconsin
Madison, Wisconsin*

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Editors' Comments

In order to enable timely publication of the proceedings, we have made no efforts to make any editorial changes or corrections on the camera-ready manuscripts that were submitted to us. About the only editorial work performed has been rearranging the sequence of papers from the order in which they were presented so that papers pertaining to similar themes may be placed more cogently in the proceedings.

We thank the contributors to this proceedings for submitting their manuscripts by the stringent deadline.

Frederick C. Bruhweiler

Yoji Kondo

Blair D. Savage

IAU Colloquium No. 81 on Local Interstellar Medium

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Foreword

There has recently been substantial improvement in our knowledge of the local interstellar medium due in no small part to the availability of X-ray and ultraviolet observations from space. At the time of the IAU General Assembly in Patras in 1982 we felt that a colloquium sponsored by the IAU would be timely and proposed it to the Executive Committee after receiving the endorsement of Commission 34 (Interstellar Matter) and Commission 44 (Astronomy from Space). At that time Art Code and Bob Bless of the University of Wisconsin graciously offered to host the meeting in Madison. The meeting that took place on 4 through 6 June 1984 at the University of Wisconsin has amply demonstrated that the subject field has come of age.

There still exist a number of knotty problems that must be addressed through future observational and theoretical work. In particular, the location and nature of the observed diffuse soft X-ray background remains an unresolved issue. The nature of radio Loop 1 and other loop structures and their relation to other observational data are among the intriguing problems yet to be clarified. The understanding of the interaction of the solar wind with the matter in the immediate environ of the solar system has made strides through such work as helium back-scattering observations but the interpretation of these results imply a wide range of uncertainties in temperature and ionization.

However, out of an apparent chaos has emerged a certain consensus, albeit one drawn with a very broad brush. It appears that the solar system is imbedded not far from the edge of a warm ($\sim 10^4$ K), relatively low density ($\sim 10^{-1}$ atom cm^{-3}) gas cloud with a radius of a few parsecs, which is surrounded by a pervasive hot ($\sim 10^5$ to 10^6 K), low density ($\sim 10^{-2}$ to 10^{-3} atom cm^{-3}) plasma that extends some fifty parsecs or more in all directions observed; the ubiquitous hot gas is most likely the result of past supernova events. The Sun appears to be moving in the general direction of the center of this warm gas cloud at a relative velocity of some 20 km s^{-1} . There is some evidence that the density is higher and the temperature lower at the core of this warm cloud but further verification is needed on this last issue.

The forthcoming launch of the Hubble Space Telescope in 1986 and the anticipated flight of extreme ultraviolet satellite Columbus later on, as well as other observational efforts in the X-ray, optical, infrared and radio regions, are expected to advance our understanding of the local interstellar medium significantly. Another such colloquium several years hence might witness the resolution of at least some of the current outstanding issues.

We thank the IAU, U.S. National Science Foundation, the University of Wisconsin and NASA for their various and much appreciated support. This meeting was also co-sponsored by the American Astronomical Society. The efficient support provided by the members of the Local Organizing Committee,

Bob Bless, John Mathis and Dan MacCammon, was much appreciated. We wish in particular to thank Bob and Dianne Bless for the generous hospitality extended to all participants at their home.

Yoji Kondo Frederick C. Bruhweiler
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Scientific Organizing Committee

Blair D. Savage
Chairman
Local Organizing Committee

IAU COLLOQUIUM PARTICIPANTS

Ardeberg, A.
Arnaud, Monique
Beckman, J. E.
Bertaux, J.
Bless, Robert C.
Blitz, Leo
Bloch, Jeff
Bochkarev, Niklay
Bregman, Joel N.
Brinkmann, Jonathan
Bruhweiler, Fred C.
Burrows, David
Buscombe, Bill
Caplan, James
Cardelli, Jason A.
Chu, You-Hua
Churchwell, Edward B.
Clark, George W.
Clayton, Jeff
Code, Arthur D.
Costero, Rafael
Cowie, L.
Cox, Donald
Crutcher, Richard M.
Cugnon, P.
Dame, Thomas
Danly, Laura
de Boer, Klaas S.
Deguchi, Shuji
Dickey, John
Ducati, Jorge R.
Eastwood, Kathleen
Edgar, Richard
Fahr, H. J.
Feitzinger, J. V.
Ferlet, R.
Fich, Michel
Fitzpatrick, Edward L.
Franco, Jose
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Gautier, T. N.
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Gilra, Daya P.
Goulet, Thomas
Gry, Cecile
Guinn, Carl
Heiles, Carl
Hobbs, Lewis
Holberg, Jay B.
Jahoda, Keith
Jenkins, Edward
Juda, Michael
Judge, Darrell
Knude, Jens K.
Kondo, Yoji
Konigl, Arieh
Kraushaar, William
Kulkarni, Shrinivas
Kumar, Krisha
Labov, Simon
Lallement, Rosine
Landsman, Wayne
Lebrun, Francois
Linsky, Jeffrey
Lockman, Felix J.
Martin, Chris
Massa, Derck
Mathis, John S.
McCammon, Dan
Mebold, U.
Meier, Robert R.
Molaro, P.
Morrison, James
Nash, Ana
Nousek, John A.
Oegerle, William R.
Oliversen, Ron
Panagia, Nino
Paresce, Francesco
Perry, Charles
Raymond, John
Reynolds, R.
Ripken, Hartmut W.
Roueff, Evelyne
Sanders, Wilton
Savage, Blair D.
Scherb, Frank
Shuter, W. L. H.
Snowden, Steven
Tinbergen, J.
Vidal-Madjar
Weaver, Harold F.
Weller, Charles
Wolfire, Mark
York, Donald G.

TABLE OF CONTENTS

	<u>Page</u>
<u>Helium and Hydrogen Backscattering Results and the Very Local Interstellar Medium.</u>	
Helium and Hydrogen of the Interstellar Medium in the Vicinity of the Sun J. L. Bertaux (Invited Speaker)	3
Pioneer 10 and Voyager Observations of the Interstellar Medium in Scattered Emission of the He 584 A and H Ly α 1216 Lines D. E. Shemansky, D. L. Judge, and J. M. Jesson	24
Changes of LISM Characteristics in the Heliospheric Interface H. W. Ripken and H. J. Fahr.	28
Broadening of the Interplanetary Helium Cone Structure Due to Elastic Collisions of LISM Helium Atoms with Solar Wind Ions H. J. Fahr, H. U. Nass, and D. Rucinski.	32
<u>Ultraviolet and EUV Absorption Studies</u>	
Absorption Line Studies and the Distribution of Neutral Gas in the Local Interstellar Medium F. Bruhweiler (Invited Speaker).	39
Synthesis of Data on Local Interstellar Medium <u>D. G. York</u> and P. C. Frisch (Invited Speaker).	51
Observations of Interstellar H I Toward Nearby Late-Type Stars W. B. Landsman, R. C. Henry, H. W. Moos, and J. L. Linsky.	60
Observations of Local Interstellar Mg I and Mg II F. Bruhweiler, W. Oegerle, E. Weiler, R. Stencel, and Y. Kondo	64
Mg II Spectra of Late Type Stars Used to Probe the LISM J. Beckman, L. Crivellari, M. Franco, P. Molaro, and . . . G. Vladilo	67

TABLE OF CONTENTS (Continued)

	<u>Page</u>
Fe II and Mg II in the nearby Interstellar Medium Klaas S. de Boer and Heinz Lenhart.	71
A Type Stars as Probes of the Local Interstellar Medium R. Freire Ferrero, R. Ferlet, and A. Vidal-Madjar	75
Probe of the Nearby ISM by the Vacant Line of Sight to β CMa C. Gry, D. G. York, and A. Vidal-Madjar	80
Deuterium Abundance in the Local Interstellar Medium R. Ferlet, C. Gry, and A. Vidal-Madjar.	84
IUE Observations of the Gaseous Component of the Local Interstellar Medium D. P. Gilra	89
Voyager EUV and FUV Observations J. B. Holberg	91
 <u>The LISM at Optical Wavelengths: Spectral Line Studies</u>	
Optical Emission Line Studies and the Warm Ionized Component of the Local Interstellar Medium R. J. Reynolds (Invited Speaker).	97
A High-Resolution Study of Local Interstellar Sodium A. Ardeberg, H. Lindgren, E. Maurice.	109
Optical Observations of Nearby Interstellar Gas P. C. Frisch and D. C. York	113
Distances of Local Clouds from Optical Line Observations R. M. Crutcher and D. J. Lien	117

TABLE OF CONTENTS (Continued)

	<u>Page</u>
<u>Optical Extinction and Polarization Studies</u>	
Local Interstellar Extinction With an Emphasis on uvby β Results	
J. Knude (Invited Speaker).	123
Optical Polarization as a Probe of the Local Interstellar Medium	
J. Tinbergen (Invited Speaker).	145
Do the Arching H I Filaments Show in Local Reddening Data?	
J. Knude.	149
A Large-Scale Dark Cloud System in the Northern Sky (Abstract)	
W. Schlosser.	152
 <u>Hot Gas in the LISM: Optical, UV, and EUV Wavelengths</u>	
Absorption Lines from Highly-Ionized Atoms	
E. Jenkins (Invited Speaker).	155
Absorption and Emission of EUV Radiation by the Local ISM	
F. Paresce (Invited Speaker).	169
Detection of Narrow C IV and Si IV Absorption Features in Spectra of Stars within 200 pc of The Sun	
P. Molaro, J. E. Beckman, M. Franco, C. Morossi, and M. Ramella.	185
Observations of Highly-Ionized Interstellar Iron	
L. M. Hobbs	189

TABLE OF CONTENTS (Continued)

	<u>Page</u>
<u>Hot Gas in the LISM: Soft X-Ray Observations</u>	
The Soft X-Ray Diffuse Background: Implications for the Nature of the Local Interstellar Medium D. McCammon (Invited Speaker)	195
Non-Local Origin of a Substantial Portion of the Soft X-Ray Background G. Clark	204
The Nature of the Soft X-Ray Emitting Region in the Direction of the North Polar Spur J. P. Morrison and W. T. Sanders, III.	211
Local Contributions to the 0.6 keV Diffuse X-Ray Background D. Burrows	215
HEAO-1 Diffuse Soft X-Ray Sky Maps J. A. Nousek, G. P. Garmire, and George Weaver	219
Ultrasoft X-Ray Background Observations of the Local ISM W. Sanders, S. Snowden, J. Bloch, M. Juda, K. Jahoda and D. McCammon.	222
Inverse Relations Between 0.25 keV Counts and Local Interstellar Dust J. Knude, P. Jakobsen, S. Labov, and S. Bowyer	226
<u>The LISM at Infrared and Millimeter Wavelengths</u>	
Molecular Clouds Within 100 pc L. Blitz, L. Magnani, and L. Mundy	231
A Wide Latitude CO Survey of Molecular Clouds in the Northern Milky Way T. M. Dame and P. Thaddeus	235

TABLE OF CONTENTS (Continued)

	<u>Page</u>
Dark Cloud and Globule Distribution for Galactic Longitudes 230 to 360 Degrees	
J. V. Feitzinger and J. Stuwe.	239
A Natural Gas Jet in a Low Velocity Shock Front at the Boundary of the Draco Nebula	
P. W. M. Kalberla, U. Herbstmeier, and U. Mebold.	243
The Draco Nebula, a Molecular Cloud Associated with a High Velocity Cloud?	
U. Mebold and P. W. M. Kalberla.	248
IRAS Observations of Small-Scale Dust Structure in the Galaxy	
N. Gautier, M. Hauser, and F. Low.	253
(No Abstract or Manuscript Received)	
 <u>The LISM at Radio Wavelengths</u>	
Structures in the H I in the Local Solar Neighborhood	
H. Weaver (Invited Speaker).	257
The Smallest Sizes of Diffuse Interstellar Clouds	
J. M. Dickey, Jacques Crovisier, and Ilya Kazes.	258
A Warm Magnetoactive Plasma in a Large Volume of Space	
C. Heiles.	263
An Investigation of Small Scale H I Structure at High Galactic Latitude	
K. Jahoda, J. M. Dickey, F. J. Lockman, and D. McCammon.	268
The Z Dependence of the Spin Temperature of H I	
S. Kulkarni, C. Heiles, J. van Gorkom, and J. Dickey	269
Polarization of Radio Molecular Lines and Mapping of Magnetic Field Direction	
Shuji Deguchi and William Watson	274

TABLE OF CONTENTS (Continued)

	<u>Page</u>
Nearby Molecular Hydrogen	
F. Lebrun.	276
Radio and UV Observations of High Latitude H I (Abstract Only)	
F. J. Lockman, L. M. Hobbs, and J. M. Shull.	280
The Parallax of Pulsar 0950+08 and the Local Free Electron Density	
C. R. Gwinn, J. H. Taylor, J. M. Weisberg, and L. A. Rawley.	281
 <u>Theoretical Models</u>	
Modeling the Local ISM as a Supernova Remnant in A Multiphase Gas	
L. Cowie (Invited Speaker)	287
A Model of the Soft X-Ray Background as a Blastwave Viewed from Inside	
R. J. Edgar and D. P. Cox.	297
Non-Equilibrium Ionization in the Local Hot Bubble	
M. Arnaud, R. Rothenflug, and R. Rocchia	301
Large-Scale Bubble Structure of the Interstellar Medium (ISM) and Properties of the Local Spiral Arm (LSA)	
N. G. Bochkarev.	309
Stromgren Trails of Hot White Dwarfs	
J. C. Raymond.	311
Magnetic Alignment Theory and the Interpretation of Polarization	
P. Cugnon.	315
Kinematics on Nearby Gas and Stars	
T. Goulet and W. C. H. Shuter.	319

TABLE OF CONTENTS (Continued)

	<u>Page</u>
Dark Matter Near the Sun: Simulated Star Counts and the Oort Limit D. L. Gildea and J. N. Bahcall.	326

Things To Come

Future Studies of the Local Interstellar Medium With Space Telescope and Columbus/FUSE B. D. Savage (Invited Speaker).	333
Observations of Local ISM Emission With the Berkeley EUV/FUV Shuttle Telescope C. Martin and S. Bowyer	344
Measuring EUV Line Emission From the Hot Interstellar Medium S. Labov, C. Martin, and S. Bowyer.	346