

## AWARDS

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### Award for a Distinguished Contribution in Mass Spectrometry



The ASMS Award for a Distinguished Contribution in Mass Spectrometry recognizes a focused singular achievement in or contribution to fundamental or applied mass spectrometry. The year 2000 award is presented to **Dr. Boris Aleksandrovich Mamyrin**, Ioffe Physical Technical Institute, St. Petersburg, Russia, for the invention and development of the ion mirror ("reflectron") for time-of-flight mass spectrometry.

Mamyrin's development of the electrostatic ion mirror ranks as one of the most innovative and important advances in mass analyzer design over the past 50 years. Early work with time-of-flight analyzers in the 1950's revealed that the large initial energy spread of the ions produced in the extraction zone considerably limited the theoretically possible resolution of these instruments. In the 1960's and 1970's, Mamyrin developed the single stage mirror with first-order time focusing, as well as the two-stage mirror, shorter in length but providing second-order time focusing and greatly improved mass resolution in time-of-flight mass spectrometers.

The ion mirror or "Mamyrin reflectron" has since played a pivotal role in elevating the time-of-flight analyzer from an instrument of modest resolution to the high-resolution analyzer of choice for a wide variety of diverse applications in biological, pharmaceutical, and industrial polymer laboratories. Such instruments are making contributions of great consequence to scientific investigations in these disciplines.

### The Biemann Medal



The Biemann Medal recognizes a significant achievement in basic or applied mass spectrometry made by an individual early in his or her career. The award is presented in honor of Professor Klaus Biemann and is endowed by contributions from his students, postdoctoral associates, and friends. The year 2000 award is presented to **Professor Julie Ann Leary** from the University of California, Berkeley, for her characterization of the role of metal ion coordination in the mass spectrometry of peptides and oligosaccharides, and for her ingenious applications of mass spectrometry to the stereochemical analysis of molecular species in the gas phase.

Dr. Leary's early investigations of anomericity and linkage position in oligosaccharides led to her use of metals and metal-ligand systems for distinguishing relative and absolute stereochemistry in the gas phase using mass spectrometry. Dr. Leary has shown that MS<sup>n</sup> can be used to unambiguously differentiate each of the four isomeric hexoses, hexosamines, and N-acetyl hexosamines when using her novel metal-ligated methodology. An important side project of this work has been the stereospecific synthesis of the diethylenetriamine-bridging saccharides, four of which have been accepted by the National Cancer Institute's Anti-Cancer Drug Discovery Program and are currently undergoing testing as potential chemotherapeutic agents. This symbiosis of synthesis and mass spectrometry is impressive in light of the fact that some of the metal-ligand-monosaccharide compounds have been characterized by X-ray crystallography and Dr. Leary has been able to show that their stereochemical differences are retained in the gas phase during MS analysis. The stereochemical analysis and determination of retention of configuration in the gas phase using electrospray ionization is an area of current research. Dr. Leary not only has conducted these important studies, but she is also directly responsible for the operation and maintenance of the Chemistry Department's Analytical Facilities (NMR, X-ray diffraction, microanalysis, computer graphics, and mass spectrometry).

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## RESEARCH AWARDS

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