Exploiting large surveys for Galactic astronomy

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Scientific Organizing Committee

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FOREWORD

Good surveys provide the lifeblood for astronomy. Without them the subject is moribund; there is nothing to answer the astronomers' most significant questions. Large resources of manpower, telescopes and data handling are going into current surveys, and even more are planned in the near future. But how do we get the most complete and precise data? How best do we go from these data to answering our scientific questions?

These thoughts had for several years been maturing among the scientific organizing committee when it proposed a Joint Discussion topic for the XXVIth General Assembly of the International Astronomical Union in Prague, August 2006. The large surveys had been holding their own meetings, specific to their particular topic and techniques. The opportunity of a Joint Discussion would bring together those specializing in many different techniques and in the all-important theoretical modeling. The interaction of those expert in characterizing and analyzing stellar data could be fruitful for the clarification of techniques, theoretical analyses, and goals for understanding Galactic structure and evolution.

This Joint Discussion 13 started by reviewing the major surveys to find out what these are telling us about the formation and evolution of our Galaxy, the model of an average late-type spiral galaxy. It looked carefully at the photometric and spectroscopic classification which is used to identify stars of different types, at stellar variability for distances, and at the complementary kinematic data from radial velocities and proper motions. The relationship of these data with theoretical models of stellar structure and atmospheres was then considered, for these are critical to age determinations and parameterization of stars. Throughout all this, the impact of these data on models of the Galaxy's formation and history was kept in mind.

As T. de Zeeuw summarized in his 'Concluding Remarks' paper, this meeting highlighted and celebrated the results of large surveys, but it also provided a forum in which participants could discuss and reflect on how far the analysis methods are achieving what is hoped from these surveys and so how best to exploit future surveys. The sense that participants had of a successful interchange is reflected in the quality of the papers presented in these proceedings. There was also a strong feeling as the meeting concluded that this fruitful interchange of expertise and ideas should be repeated after results from new surveys, space- and ground-based, become known. The next meeting should be longer in duration and so include the kind of data, especially from the radio region, that necessarily got small mention in the day and a half possible this time. Meanwhile there was optimism, given the true 'joint discussion' achieved during this meeting, in predicting how future surveys and theoretical modeling might give their best answers to astronomy's key questions on Galactic astronomy.

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