Metal production and distribution in a hierarchical Universe

Les rencontres de l'Observatoire 2013

ESO Workshop

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FOREWORD

Metals trace the full evolution of the Universe: from primordial Helium and Lithium in the big-bang nucleosynthesis to all heavier elements produced in stars and explosive events. Determining their relative abundances in different environments, and across cosmic time, reveals the underlying star formation history and gas exchange processes. Recent progress in instrumentation and modeling now permits using metal production and distribution to test our ideas of galaxy evolution at many different hierarchical scales: from stellar clusters to clusters of galaxies. The hierarchical build up of present-day structures at different redshifts can also be followed, which go in parallel with the build-up of stellar and metal mass. These processes are interwoven: during most of cosmic history metal production happens at stellar scales, but metal distribution is effective on spatial scales covering several orders of magnitudes. Therefore simulations require exceptional computational power, and tracing metals across cosmic time needs an equivalent investment in observational facilities. Both aspects are reaching some maturity in these days, for this reason we have organised a meeting to review the state of the art in all the different research areas.

We are grateful to all the participants for giving rise to a very lively workshop with many interesting presentations (both oral and posters) and discussions. This workshop could not have been organized without the support of Observatoire de Paris and of the European Southern Observatory, we are very grateful to both Observatories. Special thanks also to the President of the Observatoire de Paris, Claude Catala, who give us permission to use the wonderful meridian hall of the Observatoire de Paris, hosting the meridian designed by Gian Domenico Cassini, for the conference dinner. Finally we acknowledge the technical and logistical support of CNRS in whose premises the workshop took place. In the concluding discussion of the conference all participants acknowledged that it proved very fruitful to bring together scientists coming from different communities and it was decided to organize another conference of this kind in three years time with the aim of making it a regular occasion to confront the people working on metal production and distribution at all times, in the whole Universe.

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