

Workshop on “Getting a Grip on Galactic Girths”

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One of the most puzzling conclusions from the last decade of galaxy observations is that massive, elliptical galaxies apparently grow in size by a factor of nearly five after they form, roughly 12 billion years ago. This growth is mysterious because ellipticals otherwise seem to change very little after they are established at early times. Numerous explanations have been put forward but none is completely satisfactory, motivating further observations to quantify the exact rates of growth, which apparently depend on the cosmic epoch as well as the galaxy’s mass, type, and local environment, not to mention detailed assumptions about the size measurement itself.

This active area of research was the subject of a lively Kavli IPMU Focus Week (February 2-6, 2015) titled “Getting a Grip on Galactic Girths.” Organized by Kavli IPMU astro postdocs Benedetta Vulcani, Claire Lackner, and Song Huang, with support from faculty members Alexie Leauthaud and Kevin Bundy, the meeting drew a highly diverse and international audience for a week of focused talks and intense discussion. Particular attention was given to ensuring ample time for debate and to highlighting work by young researchers in the field as exemplified

by the outstanding response to the final meeting summary given by postdoc Song Huang, a privilege typically reserved for the most senior attendees at academic meetings.

The meeting generated a very positive immediate response. Participants were appreciative of the opportunity to get a global view of the latest work in the field, as told by some of the most active researchers. In addition, several aspects of the subject that were initially hazy, emerged from the week with greater clarity. There was some consensus, for example, that galaxies living in dense environments (e.g., galaxy clusters) at early times have experienced accelerated size growth, a head-start that apparently disappears by the present day. There was also progress

towards interpreting apparently discrepant observations about the frequency of galaxies with a certain size and mass over cosmic time.

One of the meeting highlights was the full Kavli IPMU APEC seminar given by Nacho Trujillo, one of the founders of the subject. Dr. Trujillo relayed his successful hunt for “relic” galaxies that have remained compact and unevolved since their initial formation. He argued that such a relic galaxy was present in our own backyard, cosmologically speaking, affording a valuable opportunity to study how these objects form. His observations represent just one of the many programs astronomers presented at the Focus Week that seek to resolve the physical nature of galaxy growth in the coming years.

