

JOINT DISCUSSION NO. 3

THE EXTRAGALACTIC DISTANCE SCALE AND THE HUBBLE CONSTANT

(Commissions 25, 28, 40, 45, 47, 48)

Edited by P.W. Hodge

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## INTRODUCTORY REMARKS

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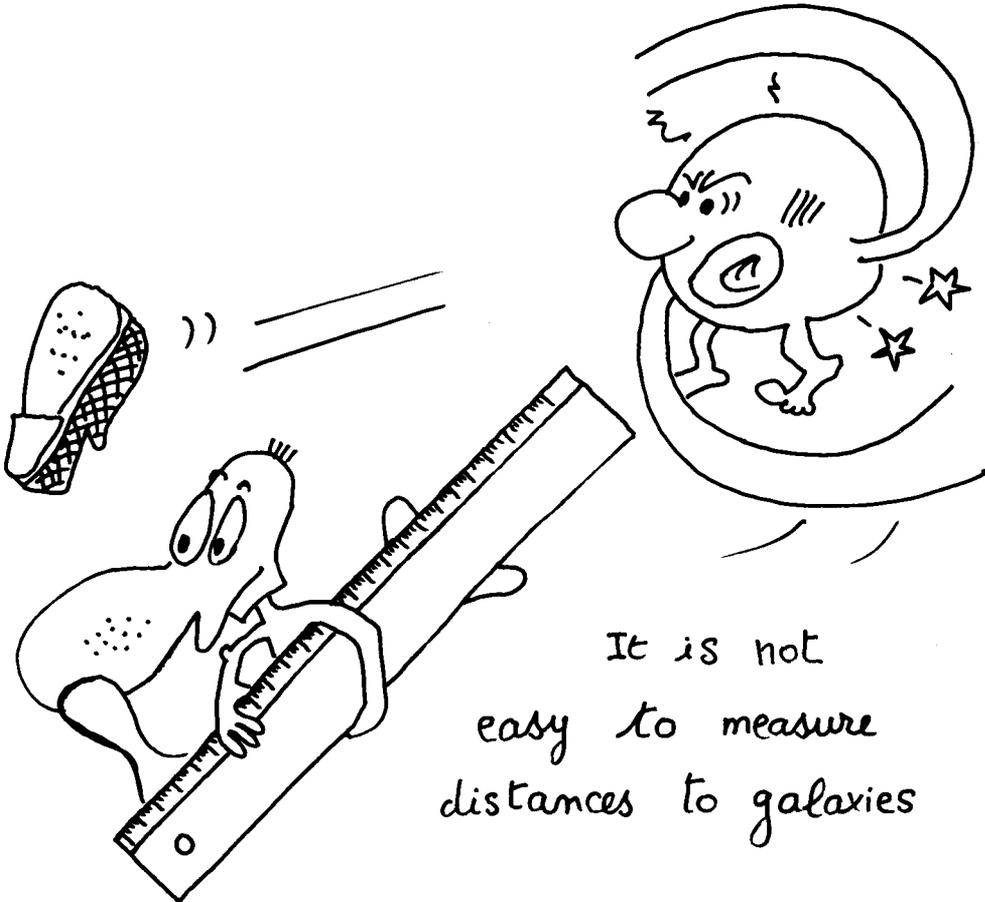
It is not easy to measure distances to galaxies. That we even try is as much a measure of our audacity as it is an indication of our ingenuity. But we do try, and we feel that we must try, because so many of our grandest questions and most basic problems about the universe depend on our knowledge of its size and scale.

This Joint Discussion brings together some of the astronomers who have concerned themselves with this difficult task. They do not all agree among themselves. This is not a topic that has reached a state of self-complacent fixity, but rather is still a subject of controversy and doubt. The Joint Discussion was designed by its organizers to expose the problems rather than to solve them, to discover the questions rather than to agree on an answer to them.

Even what topics should be discussed was the subject of disagreements within the committee. For example, the relevance or lack of it of the topic of ages was argued about, as readers of the papers and comments will detect. In the end we included it because, legitimately or not, it traditionally has been discussed in connection with the cosmic distance scale and restrictions on models of the universe.

Perhaps the most puzzling aspect of the current uncertain state of affairs is the way in which the present answers, the various values of  $H_0$ , distribute themselves. Rather than falling in a Gaussian manner about some most-popular mean value, they tend to lie on two peaks, well-separated from each other. Is this the result of the human history of research on this subject? Is it because of the early domination by one person, Hubble, whose scientific descendants had the field almost exclusively to themselves until other strong personalities entered the arena? Or is it the result of divergent methods, whose half-perceived biases have led along divergent paths to two well-separated destinations? Perhaps both of these effects are at least partly responsible. The question of how this state of affairs came about is, to purists at least, irrelevant to the problem of  $H_0$ , but to an impure observer of the process it is not only relevant but it

provides hints that could be pointing towards the eventual answer. However, these introductory remarks have gone on too long and, rather than speculate further, I will cut them short so as to allow you now to hear and see the evidence itself.



It is not  
easy to measure  
distances to galaxies

G. Paturel

(Adapted from a picture by G. Adam)