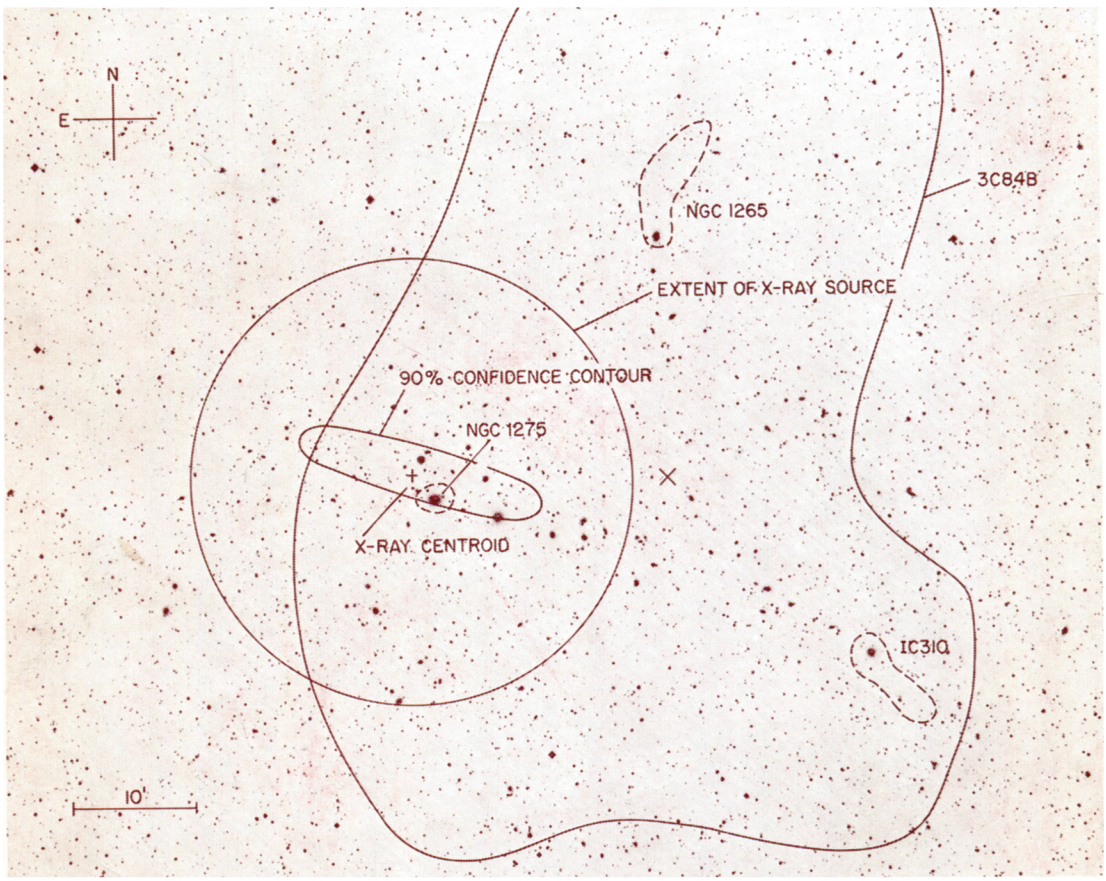
INTERNATIONAL ASTRONOMICAL UNION

SYMPOSIUM No. 55

X- AND GAMMA-RAY ASTRONOMY

Edited by H. BRADT and R. GIACCONI



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I.A.U. Symposium No. 55 on X- and Gamma-Ray Astronomy has occurred at an important moment in the development of these new branches of observational astronomy. In X-ray astronomy the data from the first X-ray observatory Uhuru have contributed to a new view of the X-ray sky and a new conception of the nature and properties of galactic and extragalactic X-ray sources. In gamma-ray astronomy the exciting and often controversial nature of the results underlines the importance of the forthcoming launch of SAS-B, the first orbiting gamma-ray observatory. The Symposium took place almost exactly ten years after the first detection of the X-ray star Sco X-1. During this time we have moved from the detection of a handful of the nearest and brightest sources to the detailed study of the nature of stellar sources in the farthest reaches of our own galaxy and in external galaxies of the local group. The detection of pulsating X-ray sources in binary systems permits the measurement of pulsation periods and orbital parameters with precisions comparable to any yet achieved with traditional observation techniques.

The strong indications that most X-ray sources are extremely compact objects give us confidence that X-ray astronomy will play a significant and possibly decisive role in the study of stars near the end point of stellar evolution.

Still from the point of view of observational advances, the study of extragalactic X-ray sources has revealed that X-ray emission is a common feature of all galaxies. A variety of different processes are observed to take place in different types of galaxies giving rise to a range of several orders of magnitude in intrinsic X-ray luminosity. The discovery that clusters of galaxies are X-ray emitters of finite angular extent and the possible correlation between X-ray luminosity and cluster parameters give us hope that X-ray astronomy will contribute significantly to our understanding of mass distribution in the universe.

From the theoretical point of view this new observational material has stimulated not only an abundant literature endeavouring to explain the nature of individual X-ray sources, but also, and perhaps more importantly, led to a rethinking of astrophysical models for the celestial objects already known to us, in the light of possible observational consequences. The role of an X-ray emitting phase in the evolution and energetics of stellar and galactic systems is only now beginning to be investigated. It is most interesting to note in this connection that we are only now beginning to realize that a short but intense X-ray emitting phase appears to be a common event in the evolution of stars in close binary systems. Thus X-ray observations are becoming more closely integrated in the main body of observational astronomy and of astrophysical theories.

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Edited by H. C. UREY (University of California at La Jolla) *and* S. K. RUNCORN (University of Newcastle-upon-Tyne)

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Edited by P. MELCHIOR (Observatoire Royal de Belgique, Brussels) *and* S. YUMI (International Latitude Observatory, Mizusawa)

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WOLF-RAYET AND HIGH TEMPERATURE STARS

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Edited by M. K. V. BAPPU (Astrophysical Observatory at Kodaikanal) *and* J. SAHADE (Observatorio Astronómico at La Plata)

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EDITED BY

H. BRADT

Massachusetts Institute of Technology, Cambridge, Mass., U.S.A.

AND

R. GIACCONI

American Science and Engineering, Cambridge, Mass., U.S.A.

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