



# CONTENTS

EDITORS' INTRODUCTION . . . . .	xi
<b>I. REPORT ON THE TEXAS SYMPOSIUM</b>	
1. GRAVITATIONAL COLLAPSE . . . . . <i>By Hong-Yee Chiu</i>	3
<b>II. COLLAPSE</b>	
2. REPORT ON THE PROPERTIES OF MASSIVE OBJECTS . . . . . <i>By F. Hoyle and William A. Fowler</i>	17
3. ON RELATIVISTIC ASTROPHYSICS . . . . . <i>By F. Hoyle, William A. Fowler, G. R. Burbidge, and E. Margaret Burbidge</i>	29
4. MASSIVE STARS, RELATIVISTIC POLYTROPES, AND GRAVITATIONAL RADIATION . . . . . <i>By William A. Fowler</i>	51
5. MASSIVE STARS IN QUASI-STATIC EQUILIBRIUM . . . . . <i>By Icko Iben, Jr.</i>	67
6. COLLAPSE OF MASSIVE STARS . . . . . <i>By F. C. Michel</i>	75
7. THE INSTABILITY OF A TOROIDAL MAGNETIC GEON AGAINST GRAVITATIONAL COLLAPSE . . . . . <i>By Kip S. Thorne</i>	83
8. THE STABILITY OF MULTISTAR SYSTEMS . . . . . <i>By T. Gold, W. I. Axford, and E. C. Ray</i>	93
9. GRAVITATIONAL COLLAPSE AND ROTATION . . . . . <i>By R. P. Kerr</i>	99
<b>III. IDENTIFICATION OF GALAXIES WITH RADIO SOURCES</b>	
10. A DISCUSSION OF GALAXIES IDENTIFIED WITH RADIO SOURCES . . . . . <i>By Thomas A. Matthews, William W. Morgan, and Maarten Schmidt</i>	105
11. THE STRUCTURE OF THE EXTRA-GALACTIC RADIO SOURCES . . . . . <i>By C. Hazard</i>	135

12. BRIGHTNESS DISTRIBUTION IN DISCRETE RADIO SOURCES. IV. A DISCUSSION OF 24 IDENTIFIED SOURCES . . . . .	159
<i>By P. Maltby, Thomas A. Matthews, and A. T. Moffet</i>	
IV. QUASI-STELLAR RADIO SOURCES	
13. THE QUASI-STELLAR RADIO SOURCES 3C 48 AND 3C 273 . . . . .	175
<i>By Jesse L. Greenstein and Maarten Schmidt</i>	
14. GALACTIC INTERSTELLAR ABSORPTION LINES IN THE SPECTRUM OF 3C 273 . . . . .	213
<i>By David R. W. Williams</i>	
15. THE PROPER MOTION OF 3C 273 . . . . .	219
<i>By William H. Jefferys</i>	
16. LIGHT VARIATIONS OF 3C 273 . . . . .	221
<i>By Harlan J. Smith</i>	
17. OPTICAL IDENTIFICATION OF 3C 48, 3C 196, AND 3C 286 WITH STELLAR OBJECTS . . . . .	231
<i>By Thomas A. Matthews and Allan R. Sandage</i>	
18. THE OPTICAL IDENTIFICATION OF THREE NEW RADIO OBJECTS OF THE 3C 48 CLASS . . . . .	261
<i>By M. Ryle and Allan R. Sandage</i>	
19. INTENSITY VARIATIONS OF 3C 48; 3C 196, AND 3C 273 IN OPTICAL WAVELENGTHS . . . . .	265
<i>By Allan R. Sandage</i>	
20. REDSHIFTS OF THE QUASI-STELLAR RADIO SOURCES 3C 47 AND 3C 147 . . . . .	269
<i>By Maarten Schmidt and Thomas A. Matthews</i>	
21. THE BRIGHTNESS OF 3C 273 AT $2.2 \mu$ . . . . .	275
<i>By Harold L. Johnson</i>	
22. ON THE MECHANISM OF RADIATION OF THE GALAXY 3C 273B . . . . .	277
<i>By V. I. Ginzburg, L. M. Ozernoy, and S. I. Syrovatskii</i>	
23. ON THE MAGNETIC FIELDS OF COLLAPSING MASSES AND ON THE NATURE OF SUPERSTARS . . . . .	283
<i>By V. I. Ginzburg</i>	
V. ORIGIN OF RADIO SOURCES	
24. THEORIES OF THE ORIGIN OF RADIO SOURCES . . . . .	291
<i>By E. Margaret Burbidge and G. R. Burbidge</i>	
25. STUDY OF THE DISTRIBUTION OF IONIZED HYDROGEN IN SOME RADIO GALAXIES . . . . .	307
<i>By G. Courtès, M. Viton, and P. Véron</i>	
26. EVIDENCE FOR AN EXPLOSION IN THE CENTER OF THE GALAXY M82 . . . . .	311
<i>By C. R. Lynds and Allan R. Sandage</i>	
27. EVIDENCE FOR THE OCCURRENCE OF VIOLENT EVENTS IN THE NUCLEI OF GALAXIES . . . . .	337
<i>By G. R. Burbidge, E. Margaret Burbidge, and Allan R. Sandage</i>	
28. RADIO STRUCTURE OF 3C 273 AND SPECTRA OF RADIO SOURCES . . . . .	373
<i>By P. A. G. Scheuer</i>	

29. RADIO SPECTRA OF A VARIETY OF NON-THERMAL RADIO SOURCES . . . . .	381
<i>By W. A. Dent and F. T. Haddock</i>	
30. ABOUT GRADIENTS OF GALAXIES . . . . .	387
<i>By E. Vanderkerkhove</i>	
31. DIPOLE MAGNETIC FIELDS OF GALACTIC DIMENSIONS . . . . .	389
<i>By Howard D. Greyber</i>	
VI. SUPERDENSE STARS	
32. SUPERDENSE EQUILIBRIUM STARS . . . . .	393
<i>By E. E. Salpeter</i>	
33. THE FORMATION OF NEUTRON STARS AND THEIR SURFACE PROPERTIES . . . . .	405
<i>By Hong-Yee Chiu</i>	
34. NEUTRON STARS . . . . .	427
<i>By L. Gratton</i>	
VII. SUMMARIES OF THE TEXAS SYMPOSIUM	
35. SUMMARY . . . . .	431
<i>By Peter G. Bergmann</i>	
36. SUMMARY . . . . .	433
<i>By R. Minkowski</i>	
37. SUMMARY . . . . .	437
<i>By P. Morrison</i>	
VIII. FURTHER CONTRIBUTIONS	
i. REPRINTS FROM "NATURE" . . . . .	441
1. Nature of Strong Radio Sources . . . . .	441
<i>By F. Hoyle and William A. Fowler</i>	
2. Investigation of the Radio Source 3C 273 by the Method of Lunar Oc- cultations . . . . .	448
<i>By C. Hazard, M. B. Mackey, and A. J. Shimmins</i>	
3. 3C 273: A Star-like Object with Large Red-Shift . . . . .	455
<i>By Maarten Schmidt</i>	
4. Absolute Energy Distribution in the Optical Spectrum of 3C 273 . . . . .	457
<i>By J. B. Oke</i>	
5. Red-Shift of the Unusual Radio Source: 3C 48 . . . . .	459
<i>By Jesse L. Greenstein and Thomas A. Matthews</i>	
6. Light Variations in the Super-luminous Radio Galaxy 3C 273 . . . . .	461
<i>By Harlan J. Smith and Dorrit Hoffleit</i>	
ii. COSMIC RAYS AND PARTICLES OF NEGATIVE MASS . . . . .	466
<i>By Yakov P. Terletsky</i>	
iii. AFTER-DINNER SPEECH . . . . .	470
<i>By T. Gold</i>	
iv. QUASI-POETRY . . . . .	471
v. LIST OF PARTICIPANTS . . . . .	473