This volume gives an historical overview of the development of professional optical and radio observatories from 1945 to today. It covers the environment in which these facilities were developed by organisations in the United States, Europe and elsewhere, often led by larger-than-life individuals, as well as exploring the financial and political factors that both constrained and encouraged progress. As progressively more expensive optical facilities were built, they exploited new technologies to significantly improve their performance: CCDs, active and adaptive optics, and spun honeycomb and segmented mirrors. The second half of this volume turns to the parallel history of radio astronomy facilities throughout the world, finishing with the ALMA observatory in Chile. This is the ground-based companion to the author’s previous work on space astronomy, *New Cosmic Horizons*; it is written for both technical and non-technical readers interested in the modern history of astronomy and its observational facilities.

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OBSERVATORIES AND TELESCOPES OF MODERN TIMES

Ground-Based Optical and Radio Astronomy Facilities since 1945

DAVID LEVERINGTON
Contents

Preface page xi

Part 1  Optical Observatories

1  Palomar Mountain Observatory  3
   1.1  The 200 inch (5.1 m) Hale Telescope  3
   1.2  Palomar Schmidt Telescopes  11

2  The United States Optical Observatory  16
   2.1  Introduction  16
   2.2  Founding of Association of Universities for Research in
       Astronomy (AURA)  17
   2.3  The National Observatory Telescopes on Kitt Peak  20
       The 84 inch (2.1 m) Telescope  20
       McMath-Pierce Solar Telescope  21
       Kitt Peak Vacuum Telescope  23
       Mayall 158 inch (4.0 m) Telescope  23
       Remote Control Telescope  25
       Restructuring  26
   2.4  Other Telescopes on Kitt Peak  27
       Steward Observatory’s 36 inch (0.9 m) and the
       Spacewatch Project  27
       Steward Observatory’s 90 inch (2.3 m) Bok Telescope  27
       University of Michigan’s 52 inch (1.3 m) and the McGraw-
       Hill Observatory  29
       Move of the Burrell Schmidt  30
       Hiltner 2.4 m Telescope  30
Contents

v

2.5 National Observatory Funding Problems 31
   WIYN 3.5 m Telescope 32
   SARA 0.9 m Telescope 33
   Turn of the Century and Beyond 33
2.6 Cerro Tololo and its National Observatory Telescopes 35
   Blanco 158 inch (4.0 m) Telescope 39
2.7 Other Telescopes on Cerro Tololo 41

3 From the Next Generation Telescope to Gemini and SOAR 47
   3.1 Next Generation Telescope (NGT) 47
   3.2 National New Technology Telescope (NNTT) 48
   3.3 Gemini 52
   3.4 SOAR 63

4 Competing Primary Mirror Designs 67
   4.1 Spun Honeycomb Mirrors 67
   4.2 Segmented Mirrors 71
      Keck Telescopes 72
      Hobby-Eberly Telescope 82
      SALT 84
      LAMOST 86
   4.3 Thin Meniscus Mirrors 87
   4.4 Metal Mirrors 89
   4.5 Liquid Mirror Telescopes 90

5 Active Optics, Adaptive Optics and Other Technical Innovations 96
   5.1 Active Optics 96
   5.2 Adaptive Optics 100
      Curvature Sensor and Bimorph Systems 102
      Altitude-Conjugate Systems 102
      Laser Guide Star Systems 103
      Multi-Conjugate Systems 105
      Adaptive Secondary Mirrors 106
   5.3 The Change to Altazimuth Mounts 107
   5.4 Charge-Coupled Devices 109

6 European Northern Observatory and Calar Alto 114
   6.1 European Northern Observatory, Canary Islands 114
      Night-time Telescopes on Tenerife 114
      Night-time Telescopes on La Palma 118
      Solar Telescopes 125
   6.2 Calar Alto 128
Contents

7 European Southern Observatory     131
  7.1 La Silla     131
    European Southern Observatory’s Early Telescopes     131
    National Telescopes on La Silla     140
    ESO’s New Technology Telescope     144
    La Silla Today     145
  7.2 Cerro Paranal     146
    The VLT     146
    VISTA     162
    VLT Survey Telescope (VST)     164
  7.3 OWL and the E-ELT     166

8 Mauna Kea Observatory     175
  8.1 Introduction     175
  8.2 Canada-France-Hawaii (CFH) Telescope     178
  8.3 NASA InfraRed Telescope Facility (IRTF)     179
  8.4 United Kingdom InfraRed Telescope (UKIRT)     180
  8.5 Subaru     181
  8.6 The Kecks and Gemini North     183
  8.7 Environmental and Other Concerns     184

9 Australian Optical Observatories     189
  9.1 Mount Stromlo, the Early Years     189
  9.2 Siding Spring
    Anglo-Australian Observatory     193
    Advanced Technology Telescope     201
  9.3 Bushfires on Mount Stromlo     202
  9.4 Optical Interferometers     204

10 Mount Hopkins’ Whipple Observatory and the MMT     207

11 Apache Point Observatory     216
  11.1 ARC 3.5 m Telescope     216
  11.2 Sloan Digital Sky Survey (SDSS)     220
  11.3 ARC 0.5 m Photometric Telescope     227
  11.4 NMSU One-Meter Telescope     227

12 Carnegie Southern Observatory (Las Campanas)     229
  12.1 Irénée du Pont Telescope     231
  12.2 Giant Magellan Telescope     232
## Contents

13 Mount Graham International Optical Observatory 238
   13.1 Vatican Advanced Technology Telescope (VATT) 238
   13.2 Columbus Project or Large Binocular Telescope (LBT) 239

14 Modern Optical Interferometers 244
   14.1 Mount Wilson 244
      *Berkeley Infrared Spatial Interferometer (ISI)* 244
      *Center for High Angular Resolution Astronomy (CHARA)* 245
   14.2 Interferomètre à 2 Télescopes (I2T) 246
   14.3 Cambridge Optical Aperture Synthesis Telescope (COAST) 247
   14.4 Infrared/Optical Telescope Array (IOTA) 248
   14.5 Palomar Testbed Interferometer 249
   14.6 Navy Prototype Optical Interferometer 250

15 Solar Observatories 254
   15.1 Climax Observatory and the Sacramento Peak Solar Observatory 254
   15.2 Big Bear Solar Observatory 257
   15.3 The GONG Helioseismology Network 259

### Part 2  Radio Observatories

16 Australian Radio Observatories 263
   16.1 Early Australian Radio Astronomy 263
      *Solar Observations* 263
      *Non-Solar Observations* 265
      *Other Radiophysics Laboratory Observatory Stations of the Late 1940s* 266
         *Potts Hill* 268
         *Badgery’s Creek* 271
         *Fleurs* 272
      *Hole-in-the-ground Antenna, Dover Heights* 274
   16.2 Parkes Radio Telescope 276
   16.3 Culgoora and the Molonglo Cross 285
   16.4 The Australia Telescope 288
   16.5 The Australian Square Kilometre Array Pathfinder and Murchison Widefield Array 292

17 Cambridge Mullard Radio Observatory 295
   17.1 The Early Years 295
   17.2 Aperture Synthesis 298
   17.3 Modern Instruments 300
Contents

18 Jodrell Bank
  18.1 From Radar to Radio Astronomy 304
  18.2 The 250 ft Mark I 306
  18.3 Later Parabolic Radio Telescopes 315
  18.4 Modifications to the Mark I 319
  18.5 MERLIN 321

19 Early Radio Observatories Away from the Australian–British Axis 326
  19.1 The Soviet Union 326
  - Lebedev Physical Institute’s (LPI’s) Radio Observatory in the Crimea 327
  - Gorki State University’s Radio Observatory 328
  - LPI’s Radio Observatory at Pushchino 329
  - Pulkovo 331
  - RATAN-600 331
  - VLBI 332
  19.2 France 332
  - Nançay 334
  19.3 The Netherlands 338

20 The American National Radio Astronomy Observatory 348
  20.1 AUI Feasibility Study and Early Programme of the 140 ft Telescope 349
  20.2 Role of the NSF in Funding Large Facilities 354
  20.3 Choice of AUI to Manage the National Radio Astronomy Observatory 354
  20.4 The First Radio Telescopes at Green Bank 356
  20.5 Green Bank Interferometer 358
  20.6 The 300 ft and its Replacement 360
  20.7 The 140 ft Telescope 365
  20.8 Millimeter-Wave Telescope 369
  20.9 Very Large Array 373
  20.10 Very Long Baseline Array 379

21 Owens Valley and Mauna Kea 385
  21.1 Owens Valley Radio Observatory 385
    Millimetre Arrays 390
  21.2 Submillimetre Radio Telescopes on Mauna Kea 391
    James Clerk Maxwell Telescope 391
    Caltech Submillimeter Observatory 392
    Smithsonian Submillimeter Array 395
Contents

22 Further North and Central American Observatories 400
  22.1 US Naval Research Laboratory 400
  22.2 MIT Lincoln Laboratory, Millstone Hill and Haystack 403
  22.3 Harvard Radio Astronomy Station, Fort Davis, Texas 408
  22.4 Vermilion River Observatory 410
  22.5 Ohio Transit Radio Telescope 413
  22.6 Arecibo Radio Telescope 415
  22.7 Algonquin Radio Observatory 423
  22.8 Dominion Radio Astrophysical Observatory 425
  22.9 Hat Creek 427
    Allen Telescope Array 428
  22.10 Five College Radio Astronomy Observatory and the
       Mexican–American Large Millimeter Telescope 430

23 Further European and Asian Radio Observatories 438
  23.1 Stockert Observatory and the Effelsberg Radio Telescope 438
  23.2 Chalmers Onsala Space Observatory and the Swedish-ESO
       Submillimetre Telescope (SEST) 444
  23.3 IRAM 447
  23.4 Indian Radio Telescopes 452
  23.5 Nobeyama Observatory 456
    Solar Telescopes 456
    Millimetre-Wave Telescopes 457
  23.6 Heinrich Hertz Submillimeter Telescope 459

24 ALMA and the South Pole 462
  24.1 ALMA 462
  24.2 South Pole 468

Name Index 473
Optical/Infrared Observatory and Telescope Index 478
Radio Observatory and Telescope Index 482
General Index 485
Preface

This book is a history of modern astronomical observatories and their telescopes. As such it covers the history of optical/infrared and radio/microwave observatories and telescopes that have been built since the Second World War. I have tried to cover the most innovative and trend-setting professional facilities and, as a result, I have excluded a discussion of most of the optical observatories established before the war even though some of them were still adding telescopes after 1945. This is because most of their new telescopes, with few exceptions, were not really innovative.

In many ways, the Palomar Observatory can be seen as the last of the major pre-war optical observatories as its first telescope, its 18/26 inch (46/66 cm) Schmidt, was built in the mid 1930s and its two main telescopes, the 200 inch (5.1 m) and the large Palomar (Oschin) Schmidt, were largely designed before the war. So maybe it should be excluded from this book, even though building of its two main telescopes was not completed until the late 1940s. But Palomar designs were innovative in many ways, setting the standards for large optical telescopes and observatories for some time to come. Consequently, I have begun my narrative with a brief outline of the design and development of the Palomar Observatory.

Ground-based astronomical observatories these days consist of more than just optical/infrared and radio/microwave facilities. For example, a number of neutrino, cosmic-ray, gamma-ray and gravity-wave observatories have been built, but I have excluded these to avoid complicating the book. Likewise, I have excluded small professional and large amateur facilities, interesting though many of them are, as this would take the book into completely new territory and make it considerably longer.

Discussing the history of professional astronomical observatories has its challenges as there are so many of them and their histories are often interconnected. It is theoretically possible to consider their history as one large interconnected story, but to produce a readable text I would have had to leave out interesting details.
xii  

Preface

which, in my opinion, would have made the book less interesting. So I have taken the alternative approach of considering their histories observatory by observatory whilst pointing out, where appropriate, how their histories are linked. Although this makes the book read a little more like an encyclopedia, I hope it is all the clearer for that enabling me to describe the unique circumstances that have led to the foundation and development of each observatory in turn.