PREFACE

Alberto J. Castro-Tirado, Shashi B. Pandey,
and María Dolores Caballero-García

LIST OF PARTICIPANTS

GROUP PHOTOGRAPH

ASTRONOMICAL OBSERVATORIES: CONSOLIDATION OF THE MODERN OBSERVATORY BETWEEN THE XVIII AND THE XXTH CENTURIES

M. A. Castro Tirado

NEW HARDWARE AND SOFTWARE DEVELOPMENT

THE 4 M NEW ROBOTIC TELESCOPE PROJECT: AN UPDATED REPORT

C. M. Gutiérrez, M. Torres, A. Oria, J. J. Fernández-Valdivia, D. Arnold,
D. Copley, C. Copperwheat, J. de Cos Juez, A. Franco, Y. Fan,
A. García Piñero, E. Harvey, H. Jermak, X. Jiang, J. H. Knapen,
A. McGrath, A. Ranjbar, R. Rebolo, R. Smith, I. A. Steele, Z. Wang, X. Wu,
D. Xu, S. Xue, W. Yuan, & Y. Zheng

TECHNICAL AND SOFTWARE UPGRADES COMPLETED AND PLANNED AT OARPAF

D. Ricci, L. Cabona, C. Righi, A. La Camera, F. Nicolosi, & S. Tosi

NEW IMPROVEMENTS AT TUG-T60 ROBOTIC TELESCOPE

M. Dindar, Y. Kilic, A. Tat, S. Dindar, & E. Kandemir

A DIN-RAIL BASED MODULAR DESIGN FOR CONTROLLING OBSERVATORIES AND TELESCOPES

A. Pál & L. Mészáros

WIND DISTURBANCE CANCELLATION FOR SMALLER ALT-AZIMUTH TELESCOPES

A. C. Unal, G. Kararsiz, C. T. Yılmaz, O. Keskin & C. Yesilyaprak

THE ZADKO OBSERVATORY

J. A. Moore, B. Gendre, D. M. Coward, H. Crisp, & A. Klotz

OPPORTUNITIES TO USE NEW ROBOTIC TELESCOPES IN SPAIN

E. Ansbro

INTRODUCING OBSERVATORY OF IRANIAN SPACE AGENCY MAHDASHT SPACE CENTER

S. H. Hendi & F. Bahrani
CONTENTS

EASTERN ANATOLIA OBSERVATORY (DAG): RECENT DEVELOPMENT IN 2019
C. Yeşilyapprak & O. Keskin 44

OBSERVATORIO EL SAUCE: HOSTING ROBOTIC SCIENCE IN CHILE
S. Ropert, R. Rojas, V. Suc, A. Zapata, J. Fertil, & A. Jordan 47

AUTOMATIC ROTATIONAL SKY QUALITY METER (R-SQM) - ANALYSIS
M. S. Niaei, C. Yeşilyapprak, E. Atalay, & E. Doğan 50

TELESOSCOPE AND OBSERVATORY CONTROL SYSTEMS

LBTO TCS SOFTWARE
P. Kubánek 52

DAG-MAM AND REMOTE CONTROL SYSTEM (UKEP)
R. Balbay, O. F. Aydemir, I. Ozturk, & C. Yesilyapprak 59

SCHEDULING

AN EXTENSIBLE FRAMEWORK FOR OBSERVATORY SYSTEM BASED ON DOCKER CLOUD
J. Han, C. Cui, D. Fan, Y. Xu, C. Li, S. Li, & L. Mi 61

SCIENTIFIC RESULTS OBTAINED AT ROBOTIC OBSERVATORIES (I): GRAVITATIONAL WAVES

GALAXY-TARGETED ROBOTIC TELESCOPE FOLLOW-UP OF GRAVITATIONAL WAVE EVENTS
L. Salmon, L. Hanlon, R. M. Jeffrey, & A. Martin-Carrillo 67

THE BOOTES NETWORK IN THE GRAVITATIONAL WAVE ERA

OPTICAL SPECTROSCOPY OF CANDIDATES IN THE LIGO/VIRGO Binary Merger Error Boxes

DECAM-GROWTH SEARCH FOR THE FAINT AND DISTANT BINARY NEUTRON STAR AND NEUTRON STAR-BLACK HOLE MERGERS IN O3A

SCIENTIFIC RESULTS OBTAINED AT ROBOTIC OBSERVATORIES (II): GRBS, FRBS AND NEUTRINO SOURCES

GAMMA-RAY BURSTS: A PERSONAL VIEW
G. J. Fishman 100

THE GRB PROMPT OPTICAL EMISSION FEATURES ON THE EXAMPLE OF GRB160625B
V. V. Topolev & V. M. Lipunov 108

OBSERVATIONAL PROPERTIES OF TEV DETECTED GRB 180720B, GRB 190114C AND GRB 190829A
R. Gupta, S. B. Pandey, A. J. Castro-Tirado, A. Kumar, A. Aryan, & S. N. Tiwari 113
CONTENTS

THE ZADKO TELESCOPE RESULTS: TEN YEARS OF SCIENCE

ROLE OF THE 3.6M DOT TO INVESTIGATE CONNECTIONS BETWEEN LONG-GRBS AND CORE-COLLAPSE SNE

SPINAR MODEL FOR BINARY NEUTRON STAR MERGER
A. R. Chasovnikov, V. M. Lipunov, & E. S. Gorbovskoy 134

SCIENTIFIC RESULTS OBTAINED AT ROBOTIC OBSERVATORIES (III): OTHER SOURCES

TAOS II: THE ROBOTIC OPERATIONS

FIRST FINDINGS ON COMETARY ACTIVITY FROM THE PTF COMET SAMPLE
N. Mouawad, J. Fraine, J. Chebly, J. M. Bauer, R. Laher, M. S. P. Kelley, & D. Bodewits 140

 STELLAR EVOLUTION AND THEIR ASTRONOMICAL OBSERVATIONS
A. Pandey 147

CITIZEN SCIENCE
THE USE OF ROBOTIC TELESCOPES IN THE SCIENCE-IES PROJECT IN SPAIN

ROBOTIC TELESCOPES FOR UNIVERSITY STUDENTS AND FACULTY
E. Ansbro & S. G. Hipólito 155

SPACE SURVEILLANCE AND TRACKING
ORBITAL UNCERTAINTY ESTIMATION SUPPORT FOR AUTONOMOUS SPACE DEBRIS OBSERVATION
H. Jiang, J. Liu, & H. W. Cheng 158

THE ROA LASER STATION: FROM ARTIFICIAL SATELLITES TO SPACE DEBRIS TRACKING

TRANSIENT DETECTION AND CLASSIFICATION
THE CHANGING EVENT SURVEY: TRANSIENTS, SPACE DEBRIS & NEOS
T. Sun, C. Zhang, Y. Ping, & X. Wu 166

AUTOMATING THE ALERT RESPONSE OF THE NU TRANSIENT TELESCOPE AT ASSY-TURGEN ASTROPHYSICAL OBSERVATORY (NUTTELA-TAO)
Z. Maksut & B. Grossan 169

THE GWAC DATA PROCESSING AND MANAGEMENT SYSTEM
Y. Xu, L. P. Xin, X. H. Han, H. B. Cai, L. Huang, H. L. Li, X. M. Lu, Y. L. Qu, C. Wu, G. W. Li, J. Wang, J. Y. Wei, & M. H. Huang 174
CONTENTS

BALLOONS AND SATELLITES
A STRATOSPHERIC BALLOON FLIGHT PLATFORM AND ITS EMPLOYMENT IN GRAVITATIONAL WAVE COUNTERPART OBSERVATION EXPERIMENTS
L. Mészáros, A. Pál, N. Werner, M. Ohno, G. Galgóczki, J. Řípa, N. Uchida, N. Hirade, H. Matake, L. Kiss, J. Kapuš, R. Laszló, & M. Koleda 180

WIDE-FIELD SURVEYS
CHARACTERIZATION OF MODERN CCD AND CMOS SENSORS FOR SKY SURVEYS S. Karpov, A. Christov, A. Bajat, R. Cunniffe, & M. Prouza 190

GLOBAL NETWORKS

LONG-TERM PHOTOMETRY WITH SKYNET ROBOTIC TELESCOPE NETWORK S. Zola, V. Kouprianov, D. E. Reichart, G. Bhatta, & D. B. Caton 206

FUTURE TRENDS

FRONTIER RESEARCH IN ASTROPHYSICS IN THE GRAVITATIONAL WAVE ERA - I F. Giovannelli & L. Sabau-Graziati 225

FRONTIER RESEARCH IN ASTROPHYSICS IN THE GRAVITATIONAL WAVE ERA - II (EXOPLANETS AND EMERGENCE OF LIFE) L. Sabau-Graziati & F. Giovannelli 235

AUTHOR INDEX 245