TEACHING AND LEARNING ASTRONOMY

Astronomy is taught in schools worldwide, but few schoolteachers have any background in astronomy or astronomy teaching, and available resources may be insufficient or non-existent. This volume highlights the many places for astronomy in the curriculum; relevant education research and “best practice”; strategies for pre-service and in-service teacher education; the use of the Internet and other technologies; and the role that planetariums, observatories, science centers, and organizations of professional and amateur astronomers can play. The special needs of developing countries, and other under-resourced areas, are also highlighted. The book concludes by addressing how the teaching and learning of astronomy can be improved worldwide. This valuable overview is based on papers and posters presented by experts at a Special Session of the International Astronomical Union.

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TEACHING AND LEARNING ASTRONOMY

Effective strategies for educators worldwide

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## Contents

*List of illustrations*  
ix  
*Preface*  
xiii  

**Introduction**  
1  

### Part I  Astronomy in the curriculum around the world

**Introduction**  
7  

1  *Why astronomy is useful and should be included in the school curriculum*  
John R. Percy  
10  

2  *Astronomy and mathematics education*  
Rosa M. Ros  
14  

Open discussion  
25  

3  *Engaging gifted science students through astronomy*  
Robert Hollow  
27  

Poster highlights  
34  

### Part II  Astronomy education research

**Introduction**  
41  

4  *Astronomy education research down under*  
John M. Broadfoot and Ian S. Ginns  
44  

5  *A contemporary review of K–16 astronomy education research*  
Janelle M. Bailey and Timothy F. Slater  
58
### Contents

6 Implementing astronomy education research  
Leonarda Fucili  

7 The Astronomy Education Review: report on a new journal  
Sidney C. Wolff and Andrew Fraknoi  

<table>
<thead>
<tr>
<th>Poster highlights</th>
<th>87</th>
</tr>
</thead>
</table>

### Part III Educating students

8 Textbooks for K–12 astronomy  
Jay M. Pasachoff  

9 Distance/Internet astronomy education  
David H. McKinnon  

<table>
<thead>
<tr>
<th>Open discussion</th>
<th>117</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster highlights</td>
<td>119</td>
</tr>
</tbody>
</table>

### Part IV Educating teachers

10 Pre-service astronomy education of teachers  
Mary Kay Hemenway  

11 In-service astronomy education of teachers  
Michèle Gerbaldi  

| Poster highlights | 153 |

### Part V Astronomy and pseudoscience

12 Astronomy, pseudoscience and rational thinking  
Jayant V. Narlikar  

13 Astronomical pseudosciences in North America  
John R. Percy and Jay M. Pasachoff
Contents vii

Part VI Astronomy and culture

Introduction 179

14 Teaching astronomy in other cultures: archeoastronomy 181
Julieta Fierro

Poster highlights 191

Part VII Astronomy in developing countries

Introduction 195

15 Astronomy curriculum for developing countries 197
Case Rijsdijk

16 Science education resources for the developing countries 206
James C. White II

Part VIII Public outreach in astronomy

Introduction 215

17 What makes informal education programs successful? 217
(Total Solar Eclipse 2001 – live from Africa)
Nahide Craig and Isabel Hawkins

18 The role of science centers and planetariums 221
Nick Lomb

19 Science education for the new century – a European perspective 227
Claus Madsen

20 Communicating astronomy to the public 235
Charles Blue

Poster highlights 238

Part IX The education programs of the International Astronomical Union

Introduction 247

21 A short overview of astronomical education carried out by the IAU 249
Syuzo Isobe
viii Contents

Part X Conclusions

Closing discussion 257

Conclusion 260

Author index 264

Subject index 267
## Illustrations

<table>
<thead>
<tr>
<th>Illustration</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>A teacher explains Kepler’s Laws at a mathematics conference (Coruna 7)</td>
<td>17</td>
</tr>
<tr>
<td>2.2</td>
<td>Relative position of the moon’s quarter</td>
<td>18</td>
</tr>
<tr>
<td>2.3</td>
<td>Shadow cone and relative positions of the Earth–moon–sun system</td>
<td>19</td>
</tr>
<tr>
<td>2.4</td>
<td>Measuring the diameter of the shadow cone</td>
<td>20</td>
</tr>
<tr>
<td>2.5</td>
<td>Measuring the diameter of the moon</td>
<td>20</td>
</tr>
<tr>
<td>2.6</td>
<td>Sticks’ situation and angles in Eratosthenes’ experiment</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Happy high-school students engaged in hands-on astronomy activities.</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Photo by Mary Kay Hemenway</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>The apple at Isaac Newton’s (1642–1727) feet is red in this fiberglass statue at the Inter-University Centre for Astronomy and Astrophysics in Pune, India. Photo by Jay Pasachoff</td>
<td>42</td>
</tr>
<tr>
<td>6.1</td>
<td>Intensifying misconceptions about orientation</td>
<td>67</td>
</tr>
<tr>
<td>6.2</td>
<td>The moon phases</td>
<td>68</td>
</tr>
<tr>
<td>6.3</td>
<td>Map of goals for teaching astronomy</td>
<td>69</td>
</tr>
<tr>
<td>6.4</td>
<td>Map of subjects for teaching astronomy</td>
<td>69</td>
</tr>
<tr>
<td>6.5</td>
<td>Investigating students’ conceptions about the shape of the Earth and gravity</td>
<td>71</td>
</tr>
<tr>
<td>6.6</td>
<td>Hands-on activities</td>
<td>72</td>
</tr>
<tr>
<td>6.7</td>
<td>Human models: “the week’s dance” and the planetary week</td>
<td>73</td>
</tr>
<tr>
<td>6.8</td>
<td>Discovering proportions and laws in the human body</td>
<td>74</td>
</tr>
<tr>
<td>6.9</td>
<td>Secchi’s observatory in Collegio Romano</td>
<td>75</td>
</tr>
<tr>
<td>6.10</td>
<td>Rome, the Pantheon in summer</td>
<td>77</td>
</tr>
<tr>
<td>6.11</td>
<td>Rome, the Pantheon in winter</td>
<td>77</td>
</tr>
<tr>
<td>6.12</td>
<td>Children’s activities in light and shadow</td>
<td>78</td>
</tr>
<tr>
<td>6.13</td>
<td>Adults’ activities in light and shadow: how many people in a human shadow?</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Bill MacIntyre (New Zealand) demonstrating modeling of seasons at a teachers’ workshop in Sydney, July 26, 2003. Photo by Rob Hollow</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Interconnections of astronomy with other fields of science and technology</td>
<td>90</td>
</tr>
</tbody>
</table>
List of illustrations

8.1 High-school graduates according to the highest level of advanced mathematics and science courses taken (http://nces.ed.gov) 98

9.1 Model of the mixed-mode delivery system (McKinnon and Nolan, 1999) 106

9.2 Case Rijksdijk (South Africa) and David McKinnon (Australia). Photo by Rob Hollow 110

Paul Francis (Australia) interacting with teachers at the 26 July 2003 teachers’ workshop in Sydney. Photo by Rob Hollow 120

A picture of Saturn captured with a reproduction of Cassini’s telescope with which he discovered the Cassini gap in the rings of Saturn 125

Students showing the interested public how to use a reproduction of Cassini’s telescope 126

Dill Faulkes explaining the project to students attending his old school, John Cleveland Community College. Copyright Faulkes Telescope LLC 2004 128

A picture of colliding galaxies NGC 2207 (right) and IC 2163 (left) taken with the Faulkes Telescope LLC. Copyright Faulkes Telescope LLC 2004 129

The dome of the Sydney Observatory Remote Telescope on the roof of the Powerhouse Museum 130

Students using a “simple measurer of angles” useful to teach mathematics and astronomy. Photo by Rosa M. Ros 132

11-year-old student modeling the apparent motion of the sun across the sky. Photo by Leonarda Fucili 143

10.1 Mary Kay Hemenway (center) interacting with teachers at a teachers’ workshop in Sydney, July 26, 2003. Photo by Rob Hollow 142

Demonstrating pre-service teacher trainees modeling the evidence to support one notion as a more appropriate explanation for the cause of seasons 157

Demonstrating the position (high in sky) of the sun in summer and the shadow formed by an object 157

Demonstrating the position (low in sky) of the sun in winter and the shadow formed by an object 158

Demonstrating the shadow formed at both equinoxes 158

Teachers at the 2002 Summer School of the European Association for Astronomy Education in Finland, doing “daytime astronomy.” Photo by Rosa M. Ros 159

Pre-service teachers busy making simple hands-on materials for teaching astronomy at the elementary-school level. Photo by Leonarda Fucili 159

12.1 A statue of Galileo Galilei (1564–1642) at the Inter-University Centre for Astronomy and Astrophysics in Pune, India. Photo by Jay M. Pasachoff 167

12.2 Statue of Aryabhatta (476–550), an Indian astronomer/mathematician, at the Inter-University Centre for Astronomy and Astrophysics in Pune, India. Photo by Jay M. Pasachoff 170

14.1 Ancient Mexico 182
List of illustrations

14.2 Center of the Aztec Calendar reproduced on a coin 182
14.3 Ek Balam, where a warrior dressed like an eagle is represented in full scale 183
14.4 Rising and setting of the sun using mountains and pyramids to measure the location 184
14.5 Ball court from a drawing in the Codex Borbonicus 185
14.6 (Left) Scale model that simulates a serpent’s shadow on the staircase of the Castle Pyramid when illuminated from the correct angle; and (Right) the actual view of the Castle Pyramid at Chichén-Itzá 185
14.7 Relative sizes of Mexico and the moon 186
14.8 (Left) Simulation of the sun and moon trajectories to explain that they cross in the sky. (Right) The Dresden Codex, where eclipse predictions are pointed out 186
14.9 Xochicalco and the effect of the sun’s rays penetrating into a cave 187
14.10 At Malinalco (right) the sun illuminates an eagle during the zenith pass 187
14.11 The teacher can use a rubber strip with rods to explain the way shadows at different latitudes are an indication of the Earth’s circumference 188
14.12 Pre-Hispanic representation of an astronomer, and the way two rods were used to measure angular distances. Notice the stars represented by eyes around the construction 188
14.13 A rigid, transparent plastic sheet, with a drawing of stars and the outline of a constellation, that can be used to find that constellation 189
15.1 Case Rijsdijk (South Africa) demonstrating the properties of light at a teachers’ workshop in Sydney, July 26, 2003. Photo by Rob Hollow 198
15.2 Case Rijsdijk with the winners of the prize for “making the best model of an astronomical event” at the annual Science Festival, SASOL SciFest 202
16.1 A page in Vietnamese from the Vietnamese textbook, Astrophysics. When looking at a spread of facing pages in Astrophysics, students see the text in Vietnamese on the left-hand side, and on the right-hand side they see the English version of the text (Fig. 16.2). The mathematics is preserved in the translation 210
16.2 A page in English corresponding to that in Vietnamese in Figure 16.1 from the Vietnamese textbook, Astrophysics. On the right-hand side of a spread of facing pages in Astrophysics, students have available to them the English translation of the Vietnamese text. Having two languages in front of them simultaneously permits students to exercise not only their scientific skills but also their language skills 211
21.1 One example of a structure of education in astronomy. Here people are divided into seven categories, A to G, depending on their level of interest in astronomy. This figure shows a structure in the shape of a pyramid, and is nearly the case in Japan 252
List of illustrations

21.2 Same as for Fig. 21.1, but with a different structure. This is not a realistic case 252
21.3 Same as for Fig. 21.1, but with a different structure. This structure is frequently seen in developing countries 252
21.4 Same as for Fig. 21.1, but with a different structure. This structure is the ideal one 253
Preface

This book is based on the proceedings of a conference on “Effective Teaching and Learning of Astronomy” held on July 24–25, 2003, in Sydney, Australia, as part of the 25th General Assembly of the International Astronomical Union (IAU). It followed two previous IAU conferences on astronomy education, held in Williamstown, Massachusetts, USA, in 1988 and in London, UK, in 1996. The conference was organized within the framework of the work of IAU Commission 46 on Astronomy Education and Development. A major emphasis in the 1996 conference was the educational potential of the Internet, and robotic and remote telescopes, and it was heartening, in 2003, to see the growth and maturity of these technologies.

But the basic challenges of astronomy education – especially at the school level – still remain. The Organizing Committee for the conference consisted of: John Dunlop (New Zealand), Julieta Fierro (Mexico), Michèle Gerbaldi (France), Mary Kay Hemenway (USA), Syuzo Isobe (Japan), Barrie Jones (UK), Margarita Metaxa (Greece), Jayant Narlikar (India), Wayne Orchiston (Australia), Jay M. Pasachoff (USA), John R. Percy (Canada, Chair), Case Rijsdijk (South Africa), Rosa M. Ros (Spain), and Graeme White (Australia), with valuable help from the local organizing committees for the General Assembly, especially Nicholas Lomb, Sydney Observatory. Special thanks are due to Magda Stavinschi (Romania), whose proposal for an IAU Resolution with respect to astronomy education was a significant inspiration for this conference.

Over a hundred astronomers and educators from over two dozen countries attended or contributed to this conference. These included the presidents of the IAU, of the American Astronomical Society (USA), and the Royal Astronomical Society (UK), among others.

The theme of the conference was effective teaching and learning of astronomy at the school level, with emphasis on strategies that could be shown to be effective by research, assessment, or experience. The primary topics of the conference were addressed by 18 invited speakers from around the world. The questions, comments, and other discussion after these papers are recorded in this book. There were also general discussions of the place of astronomy in the school curriculum, and of future directions and initiatives in the effective teaching and learning of astronomy; these too are recorded here. In addition, there were several dozen contributed papers that were presented as posters at the conference. The abstracts of these have been woven into this book. Finally, there were a number of papers that were submitted to this conference by individuals who, in the end, were not able to attend. We have included brief summaries of many of these papers as well. A subsequent conference on Communication in Astronomy was held in Washington, DC, and led to the adoption of the “Washington Charter” for public outreach. We include the charter and some discussion of its relation to the goals of this book. We thank all the authors and contributors. This book is primarily their work.
Preface

We acknowledge the generous support of the IAU and its Executive Committee, both in the form of travel grants for some participants and in the form of moral support for the importance of education. Many other participants received support from their institutions or countries, and we are grateful to those who made sure that these individuals could attend and participate.

The work of the IAU Commission on Education and Development continues. Its breadth can be seen on the Commission’s web page at http://www.astronomyeducation.org

The bulk of the work of formatting this book in $\LaTeX$ was done by Joseph B. Wilson at the University of Toronto. We thank him for his hard work and good judgment. We are grateful to Dr. Naomi Pasachoff for her careful reading of the manuscript and her corrections and suggestions. We also acknowledge a grant from the Natural Sciences and Engineering Research Council of Canada for partial support for the creation of this book.

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