

Contents

1 Let's Make the Universe: Light and Matter	1
The First Instants	2
Matter and Antimatter	3
Fusion and Nucleosynthesis	5
The First Atoms and the Pictures of the New-Born Universe	6
Fossil Radiation	7
The First Stars	10
Supernovae: All the Elements Are Born	11
First	12
Second	12
Third	13
Galaxies	14
2 Let's Make the Rest of the Universe	15
What's in the Sky Between Star and Star?	15
Interstellar Molecules	17
Life Bricks and Stardust	19
From Clouds to Nests of Stars	20
Fasting Stars	23
Let's Make Planetary Systems	24
Let's Make Our Solar System	27
Let's Make the Earth	29
3 Astronomy in Search of Alien Planets	33
The First Extrasolar Planet	34
The Transits Method	37

The Method of Gravitational Lenses	39
Other Methods Employed in ‘Seeing’ Extrasolar Planets	40
What Can We Learn from the Planets	
We Already Found?	41
What Planets We Would Like to Find	44
4 Contact Astronomy: The Universe Invades Us	47
A New Science, as Old as the Hills	48
The Murchison Meteorite	49
Natural Exchanges Among Planets:	
It Is No Science Fiction	51
A Very Special (Martian) Rock	55
5 Contact Astronomy: Ourselves, the Invaders	59
First Steps Outside Earth	59
Going to Venus and Mars	62
Our Print on Other Planets	64
More Close Encounters	65
Is There Life on Mars?	68
6 Contact Astronomy: Comet Dust	75
From Giotto Comet to the Bombarded Comet	76
A Bit of Hair Caught and Brought Back to Earth	78
Sun Dust on Earth	80
7 From Bricks to House: What Is Life?	83
Introduction	83
What Is Life?	85
Life: A Probable Phenomenon or a Coincidence?	88
Life: Constructive Approaches and Deductive	
Approaches	89
Life 2.0?	90
Panspermia	92
8 Is There Anybody Out There?	97
The Saga of the Martians	98
Ozma and Drake’s Equation	103
SETI: Galactic Eavesdropping @ Home	105
The ‘Berlusconi Bubble’	107
A Message in a Bottle	108

9 CODA: What Remains to Be Discovered?	111
10 15 Stories To Get Rid Of	117
11 You Might Not Know That	121
References	127



<http://www.springer.com/978-88-470-2465-6>

We are the Martians

Connecting Cosmology with Biology

Bignami, G.F.

2012, XXIII, 128 p. 22 illus., Softcover

ISBN: 978-88-470-2465-6