

Contents

1	Lines in positive genus	1
	<i>Diana Davis</i>	
1	Billiards	2
2	The square torus	4
3	Cutting sequences	7
4	Revisiting billiards on the square table	10
5	Symmetries of the square torus	13
6	Continued fractions	17
7	Continued fractions and cutting sequences	20
8	Every shear can be understood via basic shears	24
9	Polygon identification surfaces	28
10	Vertices and the Euler characteristic	31
11	Cylinders	36
12	Square-tiled surfaces	40
13	Regular polygons and the modulus miracle	43
14	Billiards on triangular tables	47
15	Ward surfaces	48
16	Bouw–Möller surfaces	49
17	Teichmüller space	51
	Bibliography	54
2	Introduction to complicated behavior and periodic orbits	57
	<i>Bryce Weaver</i>	
1	Introduction	57
2	Definitions and first examples	59
3	Complicated systems and structures	71
4	Counting periodic orbits	82
5	Final remarks	93
6	Appendix: Proof of mixing	95
	Bibliography	99
3	Around the boundary of complex dynamics	101
	<i>Roland K. W. Roeder</i>	
1	Warm up	102
2	Mandelbrot set from the inside out	120
3	Complex dynamics from the outside in	133
4	Complex dynamics and astrophysics	145
	Bibliography	153

4	Recurrence vs transience	157
	<i>Pablo Lessa</i>	
1	Introduction	158
2	The entry fee: A crash course in probability theory	168
3	The flow theorem	181
4	The classification of recurrent groups	191
	Bibliography	198
	Index	202