

# Contents

<b>Preface</b>	IX
<b>1 Modular introduction</b>	
1.1 The modular group	1
1.2 Maass forms	3
1.3 Holomorphic modular forms	5
1.4 Fourier expansion	7
1.5 More modular forms	9
1.6 Truncation and perturbation	14
1.7 Further remarks	18
<b>I General theory</b>	
<b>2 Universal covering group</b>	
2.1 Upper half plane	25
2.2 Universal covering group	27
2.3 Automorphic forms	31
<b>3 Discrete subgroups</b>	
3.1 Cofinite groups	33
3.2 The quotient	35
3.3 Canonical generators	37
3.4 Characters	42
3.5 Notations	44
<b>4 Automorphic forms</b>	
4.1 Fourier expansion	48
4.2 Spaces of Fourier terms	51
4.3 Growth condition	58
4.4 Differentiation of Fourier terms	61
4.5 Differentiation of automorphic forms	65
4.6 Maass-Selberg relation	66
<b>5 Poincaré series</b>	
5.1 Construction of Poincaré series	71
5.2 Fourier coefficients	78

**6 Selfadjoint extension**

6.1 Hilbert space . . . . .	86
6.2 Energy subspace . . . . .	88
6.3 Fourier coefficients . . . . .	91
6.4 Compactness . . . . .	94
6.5 Extension of the Casimir operator . . . . .	97
6.6 Relation to automorphic forms . . . . .	99
6.7 The discrete spectrum . . . . .	101

**7 Families of automorphic forms**

7.1 Parameter spaces . . . . .	107
7.2 Holomorphic families . . . . .	109
7.3 Families of eigenfunctions . . . . .	113
7.4 Automorphic transformation behavior . . . . .	117
7.5 Families of automorphic forms . . . . .	123
7.6 Families of Fourier terms . . . . .	124
7.7 Differentiation . . . . .	130

**8 Transformation and truncation**

8.1 Parameter space . . . . .	133
8.2 Transformation . . . . .	135
8.3 Truncation . . . . .	138
8.4 Energy subspace . . . . .	141
8.5 Families of automorphic forms . . . . .	147

**9 Pseudo Casimir operator**

9.1 Sesquilinear form . . . . .	151
9.2 Pseudo Casimir operator . . . . .	156
9.3 Meromorphy of the resolvent . . . . .	160
9.4 Meromorphic families . . . . .	167
9.5 Dimension . . . . .	174

**10 Meromorphic continuation**

10.1 Cells of continuation . . . . .	177
10.2 Meromorphic continuation . . . . .	180
10.3 Functional equations . . . . .	185

**11 Poincaré families along vertical lines**

11.1 General results . . . . .	191
11.2 Eisenstein families . . . . .	198
11.3 Other Poincaré families . . . . .	203

**12 Singularities of Poincaré families**

12.1 Local curves . . . . .	213
12.2 Value sets . . . . .	217
12.3 General results . . . . .	221
12.4 General parameter spaces . . . . .	227
12.5 Restricted parameter spaces . . . . .	230

**II Examples****13 Modular group**

13.1 The covering group . . . . .	239
13.2 Fourier expansions . . . . .	244
13.3 The modular spectrum . . . . .	247
13.4 Families of modular forms . . . . .	249
13.5 Derivatives . . . . .	252
13.6 Distribution results . . . . .	258

**14 Theta group**

14.1 Theta group . . . . .	265
14.2 The covering group . . . . .	266
14.3 Fourier expansions . . . . .	268
14.4 Eisenstein series . . . . .	271
14.5 More than one parameter . . . . .	274

**15 Commutator subgroup**

15.1 Commutator subgroup . . . . .	275
15.2 Automorphic forms . . . . .	278
15.3 The period map . . . . .	280
15.4 Poincaré series . . . . .	284
15.5 Eisenstein family of weight 0 . . . . .	286
15.6 Harmonic automorphic forms . . . . .	290
15.7 Maass forms . . . . .	302

<b>References . . . . .</b>	<b>307</b>
-----------------------------	------------

<b>Index . . . . .</b>	<b>311</b>
------------------------	------------



<http://www.springer.com/978-3-0346-0335-5>

Families of Automorphic Forms

Bruggeman, R.W.

1994, X, 318 p., Softcover

ISBN: 978-3-0346-0335-5

A product of Birkhäuser Basel