

# Contents

<b>Symbols</b>	<b>xvii</b>
<b>Preface</b>	<b>xix</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Fourier transform . . . . .	2
1.2 Heisenberg group . . . . .	8
1.3 Weyl transform . . . . .	12
1.4 Curvature in Fourier Analysis . . . . .	16
1.5 Outline of the thesis . . . . .	20
<b>2 Smooth hypersurfaces of positive Gaussian curvature</b>	<b>21</b>
2.1 Introduction . . . . .	21
2.2 Compact operators and the Schatten classes . . . . .	23
2.3 Harmonic oscillator . . . . .	29
2.4 Proof of the main result . . . . .	30
2.5 Conclusion . . . . .	40
<b>3 Real-analytic submanifolds of finite type</b>	<b>43</b>
3.1 Introduction . . . . .	43
3.2 Twisted convolution of measures . . . . .	44
3.3 Proof of the main result . . . . .	46
3.4 Curve in $\mathbb{R}^2$ . . . . .	52
3.5 Conclusion . . . . .	54
<b>4 Compactly supported distributions</b>	<b>57</b>
4.1 Introduction . . . . .	57
4.2 Weyl transform of a tempered distribution . . . . .	58
4.3 An observation of Tim Steger . . . . .	63
4.4 Proof of the main result . . . . .	67

---

4.5	Conclusion . . . . .	74
<b>5</b>	<b>Applications</b>	<b>77</b>
5.1	Quantum translates . . . . .	77
5.2	Restriction theorem . . . . .	81
	<b>Bibliography</b>	<b>85</b>
	<b>List of Publications</b>	<b>93</b>