Contents

Part I Superconducting Single Photon Detectors: Technology and Applications

1 Superconducting Nanowire Architectures for Single Photon Detection 3
Faraz Najafi, Francesco Marsili, Varun B. Verma, Qingyuan Zhao, Matthew D. Shaw, Karl K. Berggren and Sae Woo Nam

2 Superconducting Transition Edge Sensors for Quantum Optics 31
Thomas Gerrits, Adriana Lita, Brice Calkins and Sae Woo Nam

3 Waveguide Superconducting Single- and Few-Photon Detectors on GaAs for Integrated Quantum Photonics 61
Döndü Sahin, Alessandro Gaggero, Roberto Leoni and Andrea Fiore

4 Waveguide Integrated Superconducting Nanowire Single Photon Detectors on Silicon 85
Wolfram H.P. Pernice, Carsten Schuck and Hong X. Tang

5 Quantum Information Networks with Superconducting Nanowire Single-Photon Detectors 107
Shigehito Miki, Mikio Fujiwara, Rui-Bo Jin, Takashi Yamamoto and Masahide Sasaki

Part II Superconducting Quantum Circuits: Microwave Photon Detection, Feedback and Quantum Acoustics

6 Microwave Quantum Photonics 139
Bixuan Fan, Gerard J. Milburn and Thomas M. Stace

7 Weak Measurement and Feedback in Superconducting Quantum Circuits 163
Kater W. Murch, Rajamani Vijay and Irfan Siddiqi

8 Digital Feedback Control 187
Diego Ristè and Leonardo DiCarlo

9 Quantum Acoustics with Surface Acoustic Waves 217
Thomas Aref, Per Delsing, Maria K. Ekström, Anton Frisk Kockum, Martin V. Gustafsson, Göran Johansson, Peter J. Leek, Einar Magnusson and Riccardo Manenti

Index 245