CLAIMS

1. A thermalization structure, comprising:

a foil comprising a first layer of a first material;

a low temperature device (LTD) operating in a cryogenic temperature range comprising a surface from which heat is transferred away from the LTD; and a coupling, wherein the coupling comprises a bond formed between the foil and the surface such that forming the bond forms a set of linear ridges in the foil, a ridge in the set of linear ridges operating to dissipate the heat.

2. The thermalization structure of claim 1, wherein the foil comprises a set of layers, the set of layers including the first layer and a second layer.

3. The thermalization structure of claim 2, wherein the second layer comprises a second material, and wherein the second material exhibits at least a threshold level of bonding ability with a third material on thea surface of the LTD when used in thea cryogenic temperature range.

4. The thermalization structure of claim 3, wherein the first material exhibits less than the threshold level of bonding ability with the third material on the surface of the LTD when used in thea cryogenic temperature range.

5. The thermalization structure of claim 1, wherein the first material exhibits at least a threshold level of thermal conductivity when used in thea cryogenic temperature range.

6. The thermalization structure of claim 1, wherein the first material exhibits at least a threshold level of bonding ability with a third material on thea surface of thea LTDdevice when used in thea cryogenic temperature range.

7. The thermalization structure of claim 1, further comprising: a pattern in the foil, wherein the pattern comprises a three-dimensional protrusion on the foil.

8. The thermalization structure of claim 1, further comprising: a pattern in the foil, wherein the pattern comprises a three-dimensional recess in the foil.

9. The thermalization structure of claim 1, further comprising: a second foil, wherein the foil and the second foil are both coupled to the LTD.

10. The thermalization structure of claim 1, further comprising: a second LTD, wherein the foil is coupled to the LTD and the second LTD.

11. The thermalization structure of claim 1, wherein the coupling between the foil and the surface of the LTD is a removable bond, such that the foil is detachable from the LTD after the foil has been coupled to the LTD.

12. The thermalization structure of claim 1, further comprising: a second foil, wherein the second foil is coupled to the foil on a side of the foil that is different from a second side that is coupled to the surface of the LTD.

13. The thermalization structure of claim 1, wherein the forming the bond further forms a set of pockets, a pocket being formed under the ridge, the pocket causing the foil to operate as an absorber of a mechanical force applied to the LTD.

14. The thermalization structure of claim 1, wherein the coupling is formed as a thermosonic weld.

15. The thermalization structure of claim 1, wherein the coupling is formed as a laser weld.

16. The thermalization structure of claim 1, wherein the coupling is formed as a thermocompression weld.

17. The thermalization structure of claim 1, wherein the coupling is formed as a set of tacks, a tack in the set of tacks shaped as a spot tack.

18. The thermalization structure of claim 1, wherein the coupling is formed as a set of tacks, a tack in the set of tacks shaped as a line tack.

19. The thermalization structure of claim 1, wherein the coupling is formed as a set of tacks, a tack in the set of tacks shaped in a pattern.

20. A computer-implemented method for fabricating a thermalization structure, the computer-implemented method comprising: forming a foil comprising a first layer of a first material; floating, over a low temperature device (LTD) operating in a cryogenic temperature range comprising a surface from which heat is transferred away from the LTD, the foil; and forming a coupling, wherein the coupling comprises a bond formed between the foil and the surface such that forming the bond forms a set of linear ridges in the foil, a ridge in the set of linear ridges operating to dissipate the heat.

21. The computer-implemented method of claim 20, wherein the foil comprises a set of layers, the set of layers including the first layer and a second layer.

22. The computer-implemented method of claim 21, wherein the second layer comprises a second material, and wherein the second material exhibits at least a threshold level of bonding ability with a third material on thea surface of the LTD when used in thea cryogenic temperature range.

23. A superconducting flip-chip device comprising: a low temperature device (LTD) operating in a cryogenic temperature range; and a thermalization structure, the thermalization structure comprising: a foil comprising a first

layer of a first material; a surface of the LTD from which heat is transferred away from the LTD; and a coupling, wherein the coupling comprises a bond formed between the foil and the surface such that forming the bond forms a set of linear ridges in the foil, a ridge in the set of linear ridges operating to dissipate the heat.

24. The superconducting flip-chip device of claim 23, further comprising: a cold weld material that is susceptible to creep upon applying to the LTD a mechanical force greater than a threshold force, the creep causing a reduction in a separation distance configured in the flip-chip device, and wherein the coupling is formed without the mechanical force greater than~~exceeding~~ the~~a~~ threshold force.

25. A quantum data processing system comprising: a quantum processor comprising a low temperature device (LTD) operating in a cryogenic temperature range; and a thermalization structure, the thermalization structure comprising: a foil comprising a first layer of a first material; a surface of the LTD from which heat is transferred away from the LTD; and a coupling, wherein the coupling comprises a bond formed between the foil and the surface such that forming the bond forms a set of linear ridges in the foil, a ridge in the set of linear ridges operating to dissipate the heat.