Thermal Conductivity Integrals

$$\int_{4\,\mathrm{K}}^{T} \lambda\,\mathrm{d}T \quad [\mathrm{W/m}]$$

T(K)	Copper (wire)	Stainless Steel	Glass	Teflon
6	800	0.63	0.211	0.113
10	3 320	2.93	0.681	0.44
20	14 000	16.3	2.0	1.64
50	50 800	135	8.46	7.16
77	68 600	317	17.5	13.0
100	80 200	528	29.2	18.7
140	97 600	939	54.2	28.7
200	122 000	1 660	103	44.2
300	162 000	3 060	199	70.2

$$\dot{Q}_{\mathrm{cond}} = \frac{A}{L}\int_{T_1}^{T_2} \lambda(T)\,\mathrm{d}T = \frac{A}{L}\left\{\int_{4\,\mathrm{K}}^{T_2} \lambda(T)\,\mathrm{d}T - \int_{4\,\mathrm{K}}^{T_1} \lambda(T)\,\mathrm{d}T\right\}$$

Homework # 1:

Estimate the heat load due to conduction down the 3 SS tubes for our small diptick cryostat.