In both analytic number theory (the Riemann Hypothesis) and mathematical physics (Ising models and Euclidean field theories) the following complex analysis issue arises. For $\rho$ a finite positive measure on the real line $\mathbb{R}$, let $H(z; \rho, \lambda)$ denote the Fourier transform of $\exp(\lambda u^2) d\rho(u)$, i.e., the integral over $\mathbb{R}$ of $\exp(izu + \lambda u^2) d\rho(u)$ extended from real to complex $z$, for those $\lambda$ (including all $\lambda < 0$) where this is possible. The issue is to determine for various $\rho$’s those $\lambda$’s for which all zeros of $H$ in the complex plane are real. We will discuss some old and new theorems about this issue.