Positive solution branch for elliptic problems with critical indefinite nonlinearity.

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We study the semilinear elliptic problem with critical nonlinearity and an indefinite weight function, namely $-\Delta u = \lambda u + h(x)u^{\frac{n+2}{n-2}}$ in a smooth, bounded (respectively unbounded) domain $\Omega \subseteq \mathbf{R}^n,\ n > 4$, for $\lambda \geq 0$. Under suitable assumptions on the weight function, we obtain the positive solution branch, bifurcating from the first eigenvalue $\lambda_1(\Omega)$ (respectively, the bottom of the essential spectrum).