This talk concerns the symplectic geometric and differential geometric aspects of the moduli space of connections on a compact Riemann surface $X$. Fix a theta characteristic $K^{1/2}$ on $X$; it defines a theta divisor on the moduli space $\mathcal{M}$ of stable vector bundles on $X$ of rank $r$ degree zero. Given a vector bundle $E \in \mathcal{M}$ lying outside the theta divisor, we construct a natural holomorphic connection on $E$ that depends holomorphically on $E$. Using this holomorphic connection, there is a canonical holomorphic isomorphism between:

1. the moduli space $\mathcal{C}$ of pairs $(E, D)$, where $E \in \mathcal{M}$ and $D$ is a holomorphic connection on $E$, and

2. the space $\text{Conn}(\Theta)$ given by the sheaf of holomorphic connections on the line bundle on $\mathcal{M}$ associated to the theta divisor.

The above isomorphism between $\mathcal{C}$ and $\text{Conn}(\Theta)$ is symplectic structure preserving, and it moves holomorphically as $X$ runs over a holomorphic family of Riemann surfaces. (joint with I. Biswas)