1014-22-501 **Peter Heinzner** and **Gerald Schwarz*** (schwarz@brandeis.edu), Department of Mathematics, Mail Stop 050, PO Box 549110, Waltham, MA 02454-9110. *Cartan decomposition of the moment map.*

Let Z be a complex space with a holomorphic action of the complex group $U^{\mathbb{C}}$, where $U^{\mathbb{C}}$ is the complexification of the compact Lie group U. We assume that Z admits a smooth U-invariant Kähler structure and a U-equivariant moment mapping $\mu\colon Z \to \mathfrak{u}^*$. We assume that $G \subset U^{\mathbb{C}}$ is a closed subgroup such that the Cartan decomposition $U^{\mathbb{C}} \simeq U \times i\mathfrak{u}$ induces a decomposition $G \simeq K \times \mathfrak{p}$ where $K = U \cap G$ and $\mathfrak{p} \subset i\mathfrak{u}$ is an $(\mathrm{Ad}\ K)$-stable linear subspace. By restriction we have an induced "moment" mapping $\mu_{i\mathfrak{p}}\colon Z \to (i\mathfrak{p})^*$. We define $\mathcal{M}$ to be the set of zeroes of $\mu_{i\mathfrak{p}}$ and we have the set of semistable points $\mathcal{S}_G(\mathcal{M}) := \{z \in Z;\ \overline{G \cdot z} \cap \mathcal{M} \neq \emptyset\}$. Then $\mathcal{M}$ is the analogue of the Kempf Ness set for linear actions. We establish the existence of a quotient $\mathcal{S}_G(\mathcal{M})/\!\!/G$ and we show that $\mathcal{M}/K \simeq \mathcal{S}_G(\mathcal{M})/\!\!/G$. We also establish a version of Luna's slice theorem as well as a version of the Hilbert-Mumford criterion. A global slice theorem is proved for proper G-actions.