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Thus we proved the correspondence. ⌟

From yet another viewpoint, we may consider a rational map $f: M \longrightarrow \mathbb{P}^n$ as a subvariety of $M \times \mathbb{P}^n$. Explicitly, we define the graph $\Gamma_f \subset M \times \mathbb{P}^n$ of f to be the closure in $M \times \mathbb{P}^n$ of the graph

$$\{(p, X) : f(p) = X\}$$

of f where defined. Note that this is an analytic subvariety: if f is given locally by

$$f : p \longmapsto [g_0(p), \cdots g_n(p)],$$

where $g_0, \cdots g_n$ are holomorphic functions with no common factor, then Γ_f will be contained in the variety

$$\Gamma_0 = (g_i(p) \cdot X_j - g_j(p) X_i = 0)$$

and will agree with Γ_0 over the domain of definition M_0 of f in M.

⌜ $\{(p, X) : f(p) = X\}$

$\Rightarrow$ $f(p) = [g_0(p), \cdots g_n(p)] = X = [X_0, X_1, \cdots X_n]$ on $U \subset M$

$\Rightarrow$ $g_i(p) X_j = g_j(p) X_i$

$\Rightarrow$ $\Gamma_0 \subset U \times \mathbb{P}^n$. $\Rightarrow$ $\{(p, X) : f(p) = X\} \subset \Gamma_0$ in $U \times \mathbb{P}^n$.

$\Rightarrow$ $\overline{\{(p, X) : f(p) = X\}} = \Gamma_f \cap U \times \mathbb{P}^n \subset \Gamma_0$. ⌟

Γ_f is thus the irreducible component of Γ_0 containing $\Gamma_0 \cap M_0 \times \mathbb{P}^n$.

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