



planetmath.org

Math for the people, by the people.

Kähler manifold

Canonical name	KahlerManifold
Date of creation	2013-03-22 15:43:26
Last modified on	2013-03-22 15:43:26
Owner	cvalente (11260)
Last modified by	cvalente (11260)
Numerical id	13
Author	cvalente (11260)
Entry type	Definition
Classification	msc 53D99
Synonym	kählerian manifold
Synonym	kähler structure
Related topic	almostcomplexstructure
Related topic	RiemannianMetric
Related topic	HyperkahlerManifold
Related topic	MathbbCIsAKahlerManifold
Related topic	SymplecticManifold
Related topic	aKahlerManifoldIsSymplectic
Related topic	AKahlerManifoldIsSymplectic
Related topic	AlmostComplexStructure
Defines	Hermitian metric tensor

Let M be a complex manifold with integrable <http://planetmath.org/AlmostComplexStructure> structure J .

Suppose M is also a Riemannian manifold with metric tensor g such that $\forall_{X,Y} g(X,Y) = g(JX, JY)$. We say that g is an *Hermitian metric tensor*.

A differentiable manifold M is said to be a *Kähler manifold* iff all the following conditions are verified:

- M is a complex manifold with complex structure J
- M is a Riemannian manifold with an Hermitian metric g
- J is covariantly constant with regard to the Levi-Civita connection ($\nabla J = 0$)

Kähler manifolds are symplectic in a natural way with symplectic form defined by $\omega(X, Y) = g(JX, Y)$