

$$H^1((\mathbb{C}^*)^n, \mathcal{O}^*) \xrightarrow{c_1} H^2((\mathbb{C}^*)^n, \mathbb{Z}),$$

i.e., any line bundle on $(\mathbb{C}^*)^n$ is determined by its Chern class.

¶ See p27 & p46. $\Rightarrow H^q((\mathbb{C}^*)^n, \mathcal{O}) = 0$ for $q > 0$.

From $0 \rightarrow \mathbb{Z} \rightarrow \mathcal{O} \rightarrow \mathcal{O}^* \rightarrow 0$, we have

$$\begin{array}{ccccccc} H^1((\mathbb{C}^*)^n, \mathbb{Z}) & \rightarrow & H^1((\mathbb{C}^*)^n, \mathcal{O}) & \rightarrow & H^1((\mathbb{C}^*)^n, \mathcal{O}^*) & \xrightarrow{c_1} & H^2((\mathbb{C}^*)^n, \mathbb{Z}) \\ & & \parallel & & & & \\ & & 0 & & & & \\ & & \parallel & & & & \\ & & 0 & & & & \end{array}$$

□

For any L we can choose our basis $\lambda_1, \dots, \lambda_{2n}$ for Λ such that in terms of the dual coordinates x_1, \dots, x_{2n} on V ,

$$c_1(L) = \sum_{\alpha=1}^n \delta_\alpha d x_\alpha \wedge d x_{\alpha+n}.$$

¶ $c_1(L) \in H^2(V/\Lambda, \mathbb{Z}) \Rightarrow c_1(L)$ is an integral, invariant 2-form on V/Λ . \Rightarrow By * on p305, $\exists \lambda_1, \dots, \lambda_{2n}$ for Λ s.t. in terms of the dual coordinates x_1, x_2, \dots, x_{2n} on V ,

$$c_1(L) \underset{\uparrow}{=} \sum_{\alpha=1}^n \delta_\alpha d x_\alpha \wedge d x_{\alpha+n}, \quad \delta_\alpha \mid \delta_{\alpha+n}.$$

(in fact, represented by)

□