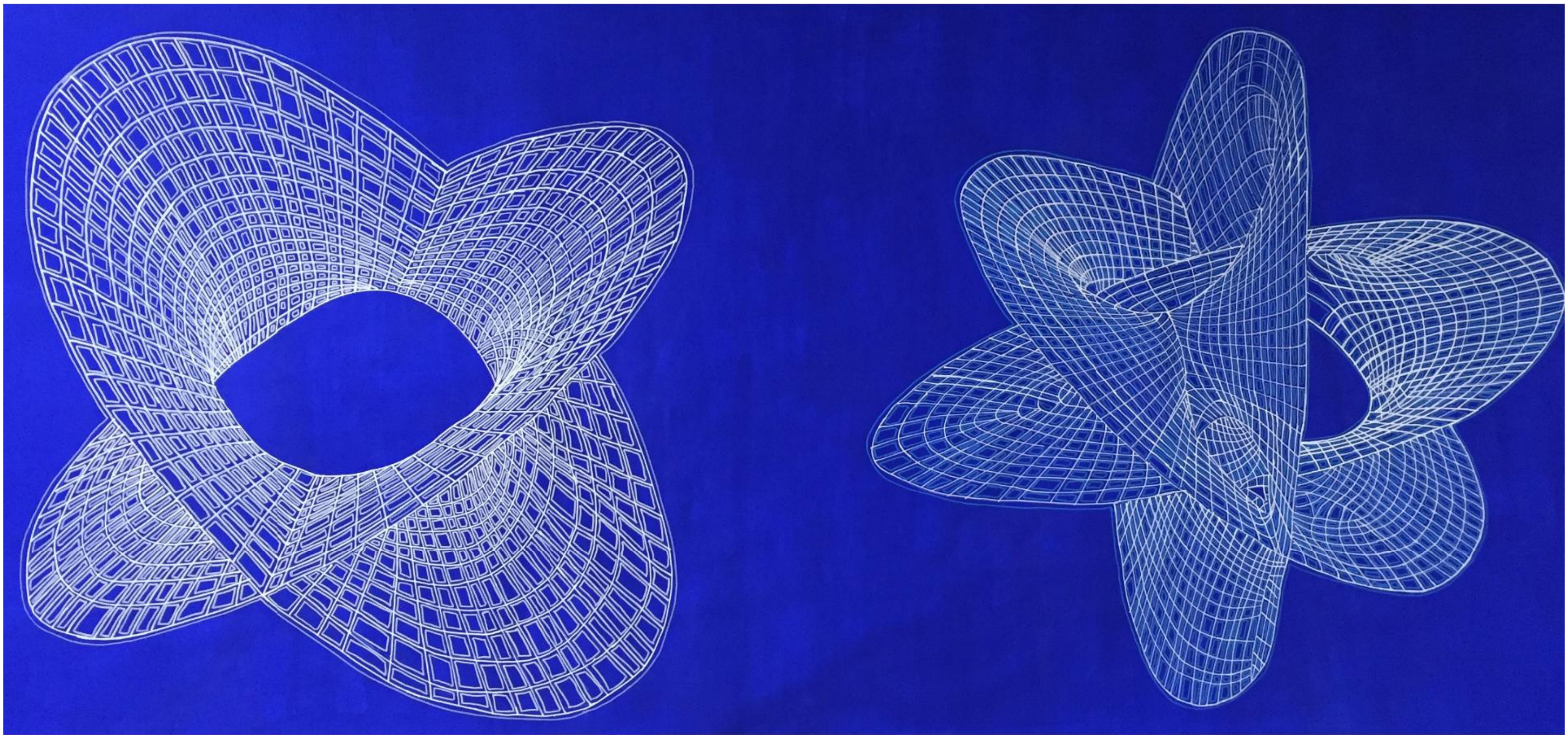
EasyChair Preprint

№ 7960

Proof - Every Compact Kähler Is a Non-Singular* Cubic 3-Fold Fano Surface

Deep Bhattacharjee

May 18, 2022



PROOF – EVERY COMPACT **K$\ddot{a}$hler** IS a NON–SINGULAR* CUBIC 3–FOLD **FANO** SURFACE
(Image Ref [1])

THEOREM

Investigating $H^n(M,\mathbb{R})$ mod $H^n(M,\mathbb{Z})\ \forall n = odd$ in $\mathbb{C}T^*$ for every compact K$\ddot{a}$hler with Hodge $h^{1,0}$ is indeed a cubic 3–fold Fano–surface dual to Picard–Albanese form

PROOF

Any Jacobean variety $\mathcal{J}$ when associated with the algebraic curve $\mathcal{C}$ then the $\mathbb{C}T^*$ holds the algebraically closed field via the compact Riemann surface where the $K - isomorphic$ polarized forms contain the $\mathcal{J}(\mathcal{C})$ with $g \geq 2$ would feature a K$\ddot{a}$hler or Hyperk$\ddot{a}$hler form obeying Torelli's theorem. Thus, taking $g = 2$ from $g \geq 2$ the Abelian form $Abe_2 \subset^{moduli\ \ spaces}\ M_2, M_{1,1} \times\ M_{1,1}$ where through proper investigation of $H^n(M,\mathbb{R})$ mod $H^n(M,\mathbb{Z})\ \forall n = odd$ in $\mathbb{C}T^*$ the non–singular 3–folds are unirational provided the line bundles over that cubic 3–fold is a Fano–surface where the smooth structures $\mathcal{S}$ are preserved over $\mathbb{P}^4 \xrightarrow{morp\ hisms} Grassmanian\ \mathcal{G}(2,5)$.

*Query

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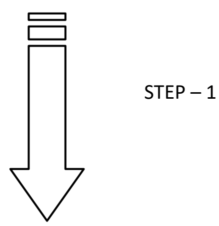
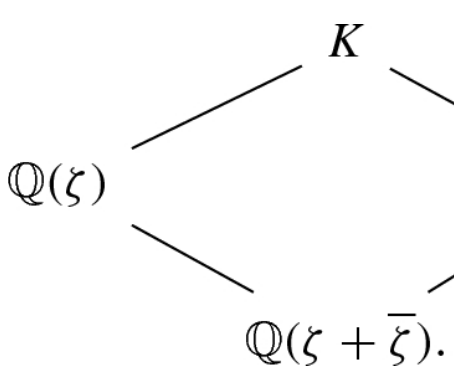
STEP BY STEP REPRESENTATIONS OF THE PROOF

$$
\begin{array}{ccccccccc}
 & & & & h^{0,0} & & & & \\
 & & & h^{1,0} & & h^{0,1} & & & \\
 & & h^{2,0} & & h^{1,1} & & h^{0,2} & & \\
 & \iddots & & & & & & \ddots & \\
h^{n,0} & & h^{n-1,1} & & \cdots & & h^{1,n-1} & & h^{0,n} \\
 & \ddots & & & & & & \iddots & \\
 & & & h^{n,n-1} & & h^{n-1,1} & & & \\
 & & & & h^{n,n} & & & &
\end{array}
$$

In this Hodge diamond – Consider Hodge number $h^{1,0}$

Image Ref [2]

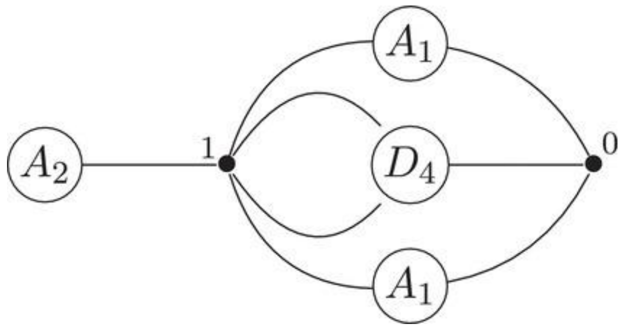




$K - isomorphic$ Polarized form

Image Ref [3]

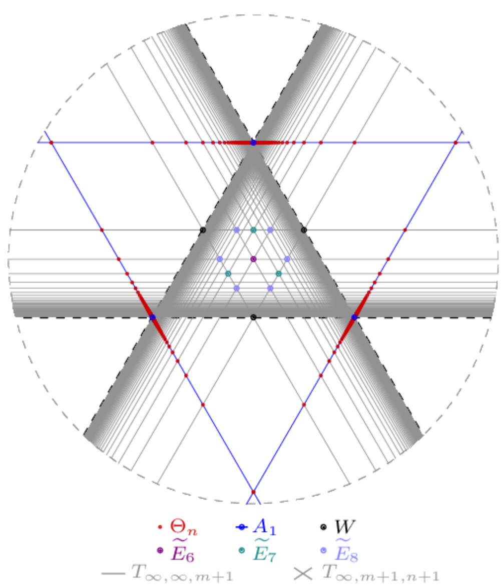
STEP – 2



Any Jacobean variety $\mathcal{J}$ when associated with the algebraic curve $\mathcal{C}$ then the $\mathbb{C}T^*$ holds the algebraically closed field via the compact Riemann surface where the $K - isomorphic$ polarized forms contain the $\mathcal{J}(\mathcal{C})$ with $g \geq 2$ would feature a Kähler or Hyperkähler form obeying Torelli's theorem. Thus, taking $g = 2$ from $g \geq 2$ the Abelian form $Abe_2 \subset^{moduli\ \ spaces}\ M_2, M_{1,1} \times M_{1,1}$

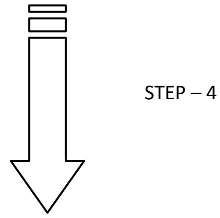
Image Ref [4]

STEP – 3



A Kähler or Hyperkähler form obeying Torelli's theorem contain the $\mathcal{J}(\mathcal{C})$ with $g \geq 2$

Image Ref [5]



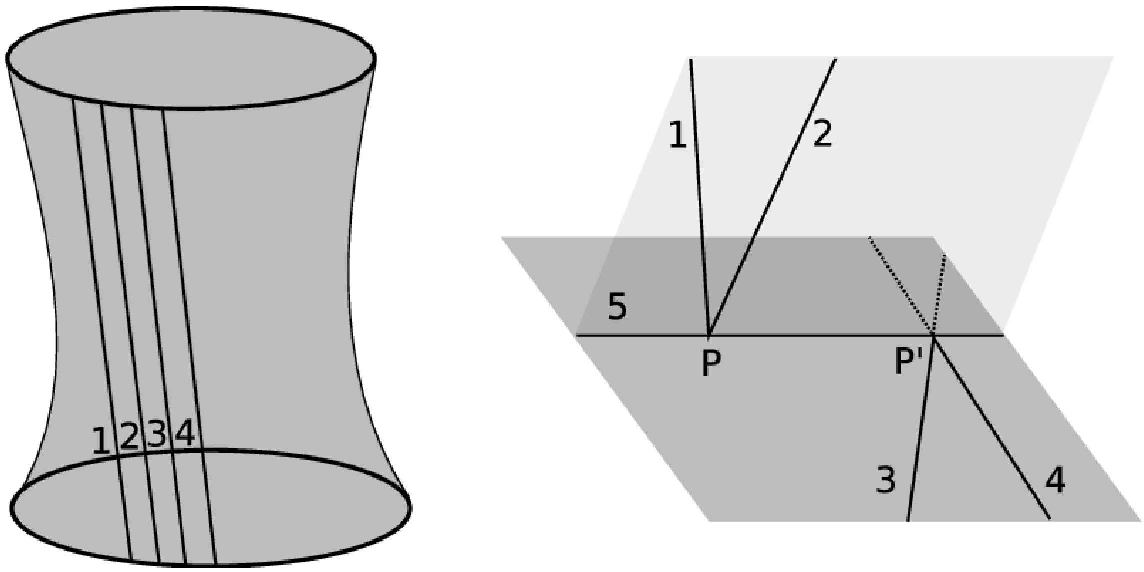


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Image Ref [6]

References:

[1] Rasch, J., 2021. Dimensions 4 - Calabi-Yau Manifold (2021). LAMINAproject. America. Seeing Within: Art Inspired by Science, The Samuel J. Wood Library at Weill Cornell Medicine. The World Unseen: Intersections of Art and Science, David J. Sencer CDC Museum in Association with the Smithsonian Institution (2019). Duality: Art + Science, American Association for the Advancement of Science (AAAS) (2018). [online] Artsy.net. Available at: <https://www.artsy.net/artwork/jody-rasch-dimensions-4-calabi-yau-manifold> [Accessed 12 May 2022].

[2] *The Hodge decomposition, diamond, and Euler characteristics*. (2022, 12 mei). mat-blag.blogspot.com. Geraadpleegd op 12 mei 2022, van http://mat-blag.blogspot.com/2016/03/the-hodge-decomposition-diamond-and.html

[3] Marseglia, S., Scholl, T. Products and polarizations of super-isolated abelian varieties. Math. Z. 300, 445–462 (2022). https://doi.org/10.1007/s00209-021-02791-x

[4] Casalaina-Martin, S., Grushevsky, S., Hulek, K., & Laza, R. (2020). Complete moduli of cubic threefolds and their intermediate Jacobians. *Proceedings of the London Mathematical Society*, *122*(2), 259–316. https://doi.org/10.1112/plms.12375

[5] Matviichuk, M., Pym, B., & Schedler, T. (2020). A local Torelli theorem for log symplectic manifolds. *arXiv: Algebraic Geometry*.

[6] Gounelas, F., & Kouvidakis, A. (2018). Measures of irrationality of the Fano surface of a cubic threefold. *Transactions of the American Mathematical Society*.