Michael Berry
H H Wills Physics Laboratory, Tyndall Avenue, Bristol BS8 1TL, United Kingdom
http://www.phy.bris.ac.uk/people/berry_mv/index.html

The arcane in the mundane

How delightful to discover our abstractions clothing Nature’s realities:

Singularities of smooth gradient maps in rainbows and tsunamis
The Laplace operator in oriental magic mirrors
Elliptic integrals in the polarization pattern of the clear blue sky
Geometry of twists and turns in quantum indistinguishability
Matrix degeneracies in overhead-projector transparencies
Gauss sums in the light beyond a humble diffraction grating

More fundamentally, we are repeatedly astonished to find, recently-developed and quietly waiting, exactly the mathematics we need for physics: Riemannian geometry awaiting general relativity, matrices awaiting quantum physics, fibre bundles awaiting gauge theories of fundamental forces... Should we be astonished? I think not. We are beings of finite intelligence in an infinite inscrutable universe. In science, our individual intelligences cooperate, and we can understand more. But still, we are able to comprehend only those structures in the natural world that mirror our mental constructs. And at any stage of humanity’s development, the most sophisticated constructs are those of our mathematics. Therefore our deepest penetration into the natural world is limited by our latest mathematics. As mathematics develops, more subtle features of the universe become accessible to our understanding. While our species survives, I see no end to this process - no ‘Theory of everything’.

So, “The unreasonable effectiveness of mathematics in the natural sciences” is not unreasonable at all; on the contrary, it is inevitable. Not unreasonable, but wonderful!
Les Déchiffreurs
Voyage en mathématiques

Jean-François Dars
Annick Lesne
Anne Papillault
Les biens de la Nature

Quel bonheur de découvrir nos abstractions dans

Le sophistique dans le banal