1167-42-254 **Carlos A Cabrelli** (`carlos.cabrelli@gmail.com`), , Argentina, **Kathryn E Hare** (`kehare@uwaterloo.ca`), , Canada, and **Ursula M Molter*** (`umolter@conicet.gov.ar`), CABA, Argentina. *On the existence of Riesz bases of exponentials.*

We address the following question: Given Ω, a subset of $\mathbb{R}^d$ of finite measure, does there exist a discrete set $\mathcal{B}$ in $\mathbb{R}^d$ such that the exponential functions $E(\mathcal{B}) = \{e^{2\pi i\beta\cdot\omega} : \beta \in \mathcal{B}\}$ form a Riesz basis of $L^2(\Omega)$?

Using the Bohr compactification of the group of integers, we are able to find necessary and sufficient condition to ensure that a *multi-tile* $\Omega \subset \mathbb{R}^d$ of positive measure (but not necessarily bounded) admits a structured Riesz basis of exponentials for $L^2(\Omega)$. The main novelty is the necessity of the condition, since before sufficient conditions had been derived.

Recall that a set $\Omega \subset \mathbb{R}^d$ is a k-multi-tile for $\mathbb{Z}^d$ if $\sum_{\lambda\in\mathbb{Z}^d} \chi_\Omega(\omega - \lambda) = k$ a.e. $\omega \in \mathbb{R}^d$. (Received March 08, 2021)