



# MARIE SKŁODOWSKA-CURIE POSTDOCTORAL FELLOWSHIPS 2024

## **EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS**

### HOST INSTITUTION

Faculdade de Ciências e Tecnologias, Universidade Nova de Lisboa

### **RESEARCH GROUP AND URL**

Algebra and Logic

### SUPERVISOR (NAME AND E-MAIL)

Reinhard Kahle kahle@fct.unl.pt

### SHORT CV OF THE SUPERVISOR

1997 PhD; 2003-08 Prof. Math. Univ Coimbra; since 2008 Prof. Math. Univ. Nova de Lisboa (since 2018 as Prof. Cat.); since 2019 also Prof. Hist. Phil. Sci. Univ. Tübingen

#### **5 SELECTED PUBLICATIONS**

- Klaus Mainzer and Reinhard Kahle, Limits of AI theoretical, practical, ethical. Springer, 2024.
- Ugo Dal Lago, Reinhard Kahle, and Isabel Oitavem. Implicit Recursion-Theoretic Characterizations of Counting Classes. Archive for Mathematical Logic, 61:1129-1144, 2022.
- Paulo Guilherme Santos and Reinhard Kahle. Variants of Kreisel's conjecture on a new notion of provability. Bulletin of Symbolic Logic, 27(4):337-350, 2021.
- Reinhard Kahle: Is there a "Hilbert Thesis"?. Studia Logica, 107(1):145-165, 2019.
- Reinhard Kahle: The Logical Cone. IfCoLog Journal of Logics and their Applications, 4(4):1087-1101, 2017.

### **PROJECT TITLE AND SHORT DESCRIPTION**

Artificial Intelligence and number-theoretic properties. Al learning algorithms are currently quite successful, for instance for text generation. In principle, Al is good to approximate continuous functions by learning a sufficient amount of data. It is unclear, however, how Al can perform for discrete number theoretic properties. While there might be theoretical reasons why primality cannot be learned by a finite amount of data; divisibility should, per se, not be problematic. In this project the aim is to investigate the learning capabilities for discrete number-theoretic properties, which can be scaled in many respects.

#### SCIENTIFIC AREA WHERE THE PROJECT FITS BEST\*

Mathematics (MAT)

\*Scientific Area where the project fits best – Please select/indicate the scientific area according to the panel evaluation areas: Chemistry (CHE) • Social Sciences and Humanities (SOC) • Economic Sciences (ECO) • Information Science and Engineering (ENG) • Environment and Geosciences (ENV) • Life Sciences (LIF) • Mathematics (MAT) • Physics (PHY)