

When the poset of normalized ideals of a numerical semigroup is a lattice

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Abstract. Given a numerical semigroup S , the set of its normalized ideals $\mathcal{I}_0(S)$ can be turned into a poset by the relation $\preceq$ defined as $I \preceq J$ if there exists a normalized ideal K such that $I + K = J$.

In this talk, we characterize when the (finite) poset $(\mathcal{I}_0(S), \preceq)$ is a lattice, proving that this holds if and only if the multiplicity $m(S)$ of S does not exceed four. Moreover, we will focus on the significance of the lattice $(\mathcal{I}_0(S), \preceq)$ for numerical semigroups of multiplicity three.

About the speaker. Stefano Bonzio has been an Associate Professor at the Department of Mathematics of the University of Cagliari (Italy) since 2021. Before joining UniCA, he held research positions at the Spanish Research Council (as a Marie Curie fellow), the University of Turin, the Polytechnic University of the Marche, and the Czech Academy of Sciences.

He is a logician mainly working in non-classical logics and the interplay between logic and algebra, including the study of algebras of logic, algebraic logic, and universal algebra (in particular, the theory of Płonka sums). He has also conducted research in semigroup theory, specifically on numerical and Clifford semigroups.

REFERENCES

- [1] S. Bonzio and P. García-Sánchez, “When the divisibility poset of the ideal class monoid of a numerical semigroup is a lattice”, pp. 79–93 in: S.T. Chapman (ed.), *The Ideal Theory and Arithmetic of Rings, Monoids, and Semigroups*, Contemporary Math. **836**, Amer. Math. Soc., 2026.
- [2] S. Bonzio and P. A. García-Sánchez. *The poset of normalized ideals of numerical semigroups with multiplicity three*, Communications in Algebra **53** (2025), no. 9, 3610–3624.

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