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Sommario/riassunto	Since the initial predictions for the existence of Weyl fermions in condensed matter, many different experimental techniques have confirmed the existence of Weyl semimetals. Among these techniques, optical responses have shown a variety of effects associated with the existence of Weyl fermions. In chiral crystals, we find a new type of fermions protected by crystal symmetries — the chiral multifold fermions — that can be understood as a higher-spin generalization of Weyl fermions. This work analyzes how multifold fermions interact with

light and highlights the power of optical responses to identify and characterize multifold fermions and the materials hosting them. In particular, we find optical selection rules, compute the linear optical response of all chiral multifold fermions, and analyze the non-linear optical responses and their relation to the presence of topological bands. Finally, the research presented here analyzes the theoretical foundations and experimental features of optical responses of two multifold semimetals, RhSi and CoSi, connecting the observed features with the theoretical predictions and demonstrating the power of optical responses to understand real-life multifold semimetals.