

# The Forgotten Pioneers of Polaritons

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**Abstract**— This talk begins with a tribute to four pioneers of polaritons, who independently developed this concept in the 1950s. Everyone of the community of light-matter interactions knows Prof. Kun Huang and John Hopfield, whose influential works on phonon-photon and exciton-photon coupling, published in 1951 and 1958, respectively, have defined the field of polaritonics. However, few may know that a quantum mechanical formalism for both phonon and exciton polaritons were first introduced by a Ukrainian physicist in 1950. And probably nobody in this audience has ever encountered the pioneering 1953 work on cavity magnon polaritons.

Who were these forgotten pioneers? What approaches did they take to study light-matter interactions? Why have their papers faded from memory? These are the questions I wish to bring to this community's attention.

I will then highlight the renaissance of cavity magnon polariton physics [1], focusing on how this unique polariton can break time-reversal symmetry — an effect that has enabled non-reciprocal control of both the transmission amplitude [2] and the speed of light [3].

1950	1951	1953	1958	Polariton
				Phonon-photon
				Exciton-photon
				Magnon-photon

Figure 1: Pioneers of Polaritons: The year and the type of polaritons they discovered.

## REFERENCES

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