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**Wojciech Dorabiala\*** (wud2@psu.edu), Department of Mathematics, Penn State Altoona, 3000 Ivyside Park, Altoona, PA , and **Bernard Badzioch**. *Categorical algebra of mapping spaces*.

One of the successes of algebraic structures was a description of the structure of  $n$ -fold loop spaces, that is spaces of maps from an  $n$ -dimensional sphere  $S^n$  to a given space  $X$ . A remarkable feature of this description is that one can decide if a space  $Y$  is of the homotopy type of an  $n$ -fold loop space just by looking at a certain algebraic structure on  $Y$ . The talk will give an overview of these results. It will also explain how the algebraic formalism involved can be extended to mapping spaces other than loop spaces and why - at least in some cases - algebraic structure is not enough to describe the structure of the mapping spaces. (Received September 07, 2007)