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## Lorentz spaces and related topics

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In this talk, we will review classical and modern results concerning Lorentz spaces  $L^{p,q}$ . We will define the Hardy-Littlewood maximal operator and study its behavior on these spaces. As a consequence, we will identify several classes of positive and locally integrable functions of great interest in Functional and Harmonic Analysis.

$$\mathcal{H}^A f(z) + (z^n \mathcal{H}^A f)(z - \delta_1)$$
$$\mathcal{H}^A f(z) < \dots \delta_1 z^n + \delta_2$$