Diophantine approximation and small denominators

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The solubility of equations in a variety of branches of mathematics, including mechanics and theoretical physics, can be compromised by the presence of small denominators. These involve Diophantine phenomena or inequalities and are closely related to classical metrical Diophantine approximation. The first part of the talk will be a survey of the relevant results from the theory of Diophantine approximation and the second part will explain and illustrate their use in some particular cases, including the Kolmogorov-Arnold theorem and the wave equation.