

**Title:**

Equations of Duffing type with a finite number of periodic solutions

**Abstract:**

In 1983 Nakajima and Seifert proved that the equation

$$u'' + cu' + \alpha u + \beta u^3 = B \sin t$$

has a finite number of  $2\pi$ -periodic solutions if  $c > 0$  and  $\beta > 0$ . After presenting the original proof I will discuss some variants of the result obtained recently in collaboration with Xingchen Yu.

As a consequence, for the nonlinear equation,  $\beta \neq 0$ , we can conclude that the number of  $2\pi$ -periodic solutions is finite if  $c \neq 0$  or if  $c = 0$ ,  $\beta < 0$  and  $\alpha \leq 1$ . These conditions on the parameters are optimal, as can be checked in the autonomous equation ( $B = 0$ ).