

$$\begin{aligned}
& \text{div} \frac{\forall f \exists g \forall a \in \text{Dom } f_0 (g(a) = \{g(x) \mid x \in f(a)\})}{\sqrt{1 + |\partial u|^2}} = 0 \\
& \sum_{h,k} \frac{\partial u}{\partial x_h} \frac{\partial u}{\partial x_k} \Gamma_{h,k} = \lim_{h \rightarrow \infty} \frac{F_h \bar{u}}{|D \bar{u}|^2} = 0 \\
& \forall f \exists g \forall a \in \text{Dom } f (g(a) = \{g(x) \mid x \in f(a) \cap A\} \cup (f(a) \setminus A))
\end{aligned}$$

# Colloquio De Giorgi

11 March  
2022  
4:00 pm

**CHRISTOPHER DENINGER**

University of Münster

***Primes, knots and periodic orbits***

Aula Dini  
Palazzo del Castelletto  
via del Castelletto  
Pisa

**Abstract:** In the 1960s Manin and Mazur noted that from the viewpoint of étale topology there was an intriguing analogy between prime numbers embedded into the spectrum of the integers and knots in 3-space. Later Kapranov, Reznikov, Morishita and other authors discovered further intriguing analogies between number rings and the topology of 3-manifolds. For example, the Iwasawa zeta function corresponds to the Alexander polynomial of a knot. The search for a cohomology theory related to the Riemann zeta function led to the discovery of analogies between number rings and a class of 3-dimensional dynamical systems, where the primes would correspond to the periodic orbits. For example, Riemann's explicit formulas in analytic number theory correspond to a transversal index theorem in the dynamical context, proved by Álvarez-López and Kordyukov. The dynamical systems analogy refines the previous analogy because forgetting the parametrization, a periodic orbit gives a knot. Recently, we have constructed foliated dynamical systems for number rings and even for all arithmetic schemes that have some but not yet all the expected properties.

Web site: <http://www.crm.sns.it/event/493/>

The event will take place in person. Please note that for organizational purposes, registration is mandatory.

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