

MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
DEPARTMENT OF MATHEMATICS

# Geometric Analysis Seminar

Wednesday, March 4, 2020

4:00pm – 6:00pm      Room 2-131

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## **“On the regularity of Ricci flows coming out of metric spaces”**

Abstract

We consider smooth, not necessarily complete, Ricci flows,  $(M, g(t))_{t \in (0, T)}$  with  $\text{Ric}(g(t)) \geq -1$  and  $|\text{Rm}(g(t))| \leq c/t$  for all  $t \in (0, T)$  coming out of metric spaces  $(M, d_0)$  in the sense that  $(M, d(g(t)), x_0) \rightarrow (M, d_0, x_0)$  as  $t \rightarrow 0$  in the pointed Gromov-Hausdorff sense. In the case that  $B_{g(t)}(x_0, 1) \subset M$  for all  $t \in (0, T)$  and  $d_0$  is generated by a smooth Riemannian metric in distance coordinates, we show using Ricci-harmonic map heat flow, that there is a corresponding smooth solution  $\tilde{g}(t)_{t \in (0, T)}$  to the  $\delta$ -Ricci-DeTurck flow on an Euclidean ball  $B_r(p_0) \subset \mathbb{R}^n$ , which can be extended to a smooth solution defined for  $t \in [0, T)$ . We further show, that this implies that the original solution  $g$  can be extended to a smooth solution on  $B_{d_0}(x_0, r/2)$  for  $t \in [0, T)$ , in view of the method of Hamilton. This is joint work with Alix Deruelle and Miles Simon.