Ji, Lizhen


From the introduction of A. Papadopoulos to “Handbook of Teichmüller theory. Volume VII”:

Chapter 4 by Lizhen Ji is a survey of Mostow’s strong rigidity theorem for locally symmetric spaces. Roughly speaking, the result says that a weak notion of isomorphism between spaces determines a stronger isomorphism between them. A well-known particular case of this theorem (also proved by Margulis) says that if two closed hyperbolic manifolds of the same dimension $\geq 3$ have isomorphic fundamental groups, then they are isometric. This result was extended by Prasad to the case of complete manifolds of finite volume. The clearest proof of this theorem is the one contained in Chapter 5 of Thurston’s Princeton lecture notes on the geometry and topology of 3-manifolds. This rigidity result is in contrast with the case of manifolds of dimension two, where there is a large space of deformations of complex structures, namely, Teichmüller space. Even though this Handbook is mainly concerned with the case of surfaces, it seemed to us interesting to have an exposition of the deformation spaces of hyperbolic structures in higher dimensions and of the more general situations to which Mostow’s strong rigidity applies, namely, finite-volume locally symmetric spaces of noncompact type. At the level of group actions, the discussion around Mostow rigidity is reduced to the comparison between the deformation theory of isomorphisms between Fuchsian groups and that of isomorphisms between lattices in semisimple Lie groups. At the same time, Chapter 4 contains a review of some aspects of the Kodaira-Spencer deformation theory of compact complex manifolds of complex dimension $\geq 2$. Mostow’s rigidity for hyperbolic 3-manifolds of finite volume admits a vast generalization to hyperbolic 3-manifolds of infinite volume where it becomes the ending lamination theorem, a subject which is treated in the next chapter of this volume.

For the entire collection see [Zbl 1435.30001].

MSC:

30F60 Teichmüller theory for Riemann surfaces
32G15 Moduli of Riemann surfaces, Teichmüller theory (complex-analytic aspects in several variables)

Keywords:

Teichmüller space; Mostow’s strong rigidity theorem

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