

Guest, M. A.; Kozłowski, A.; Murayama, M.; Yamaguchi, K.

The homotopy type of the space of rational functions. (English) Zbl 0862.55011

J. Math. Kyoto Univ. 35, No. 4, 631-638 (1995).

The authors study the space of all holomorphic self maps of degree d on the Riemannian 2-sphere $S^2 = \mathbb{C} \cup \infty$. This space is denoted Hol_d , and Hol_d^* denotes those maps preserving a base point. Graeme Segal showed that $\pi_k(\text{Hol}_d) \cong \pi_k(\text{Map}_d)$ if $k < d$ where Map_d is the space of self maps of S^2 . Similarly, $\pi_k(\text{Hol}_d^*) \cong \pi_k(\text{Map}_k^*) \cong \pi_{k+2}(S^2)$. The authors calculate the homotopy groups for Hol_d in terms of the homotopy groups for S^3 and S^2 for $k \geq 2$ and $d = 1$ and $d = 2$. For $d \geq 3$ and $k = 2$, the authors prove $\pi_k(\text{Hol}_d) \cong \pi/2$. Also, if $d > k \geq 3$, then $\pi_k(\text{Hol}_d) \cong \pi_{k+2}(S^2) \oplus \pi_k(S^3)$. The authors identify Hol_2 and Hol_2^* with certain homogeneous spaces. Also they study, as an application, the operated structure on $\bigsqcup_{d \geq 0} \text{Hol}_d$.

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MSC:

[55Q52](#) Homotopy groups of special spaces

[57R35](#) Differentiable mappings in differential topology

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Cited in **4** Documents

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