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**Samuel B. Smith\*** ([smith@sju.edu](mailto:smith@sju.edu)), Department of Mathematics, Saint Joseph's University, Philadelphia, PA 19131. *Gauge groups and related structures in rational homotopy theory*. Preliminary report.

Let  $G$  be a connected Lie group and  $P \rightarrow X$  a principal  $G$ -bundle over a compact, metric space  $X$ . We determine the rational H-type of the gauge group  $\mathcal{G}(P)$ . We also prove two related results. Given a complex matrix bundle  $\xi: M_n \rightarrow E \rightarrow X$  with space of sections  $A_\xi$ , we determine the rational H-type of the group  $UA_\xi$  of unitaries of this  $C^*$ -algebra. We also determine the rational H-type of the monoid  $\text{Aut}(\xi)$  of fibre self-equivalences of a fibration  $\xi$  of simply connected spaces with fibre a homogeneous space  $G/H$  with  $H \subseteq G$  a closed subgroup of maximal rank. This is joint work with various coauthors: Y. Félix, J. Klein, G. Lupton, C. Phillips and C. Schochet. (Received August 18, 2008)