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*Function Algebras Invariant under Group Actions*

We will answer a question raised by Ronald Douglas in connection with his work on a conjecture in operator theory due to William Arveson. Let  $S$  denote the unit sphere in  $\mathbf{C}^n$ . If  $A$  is a function algebra on  $S$  that contains the ball algebra  $A(S)$  and whose maximal ideal space is  $S$ , and if  $A$  is invariant under the action of the  $n$ -torus on  $S$ , does it follow that  $A = C(S)$ ? When  $n = 1$ , Wermer's maximality theorem gives immediately that the answer is yes. Surprisingly, in higher dimensions the answer depends on the dimension. The proof is related to a peak point theorem of John Anderson and the speaker and counterexamples to the peak point conjecture due to Richard Basener and the speaker.

We will also present a conjecture of a more general nature concerning function algebras that are invariant under a transitive group action, and we will prove the conjecture under a mild additional hypothesis.