

ZULF ACKNOWLEDGES DEBT TO JOHN MILNOR, RAOUL BOTT, MICHAEL ATIYAH

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1. NOTE THAT I DID NOT MENTION SIMON DONALDSON OR NIGEL HITCHIN OR CLIFF TAUBES OR KAREN UHLENBECK

I do have debts to all these people, but not in this note. In this note I want to acknowledge people who are so deeply part of my training in mathematics that I don't even think about them all that often. And these are Michael Atiyah, Raoul Bott, and John Milnor. These are mathematicians who had shaped topology and geometry at a very deep fundamental level to the point where I don't even know what fundamental objects of study are without them. You see I began going towards topology and geometry already from high school. I was already well acquainted with college level point-set topology from courses at City University of New York. My dear high school teacher Lys Waltien had spent her own money to buy me Raoul Bott and Loring Tu's *Differential Forms in Algebraic Topology* and Abraham and Marsden's book on Tensor Analysis in mechanics during high school as well as the Chauvenet papers which included beautiful papers of Shing-Shen Chern.

At Princeton I took Algebraic Topology (with William Browder) and Differential Geometry (with Frederic Bien) in my sophomore year. I did well and was overwhelmed by work. I struggled to gain understanding of topology and geometry.

For me, Michael Atiyah, Raoul Bott, and John Milnor's textbooks and lectures more than their research work was just the foundations of all things in geometry. I took them very seriously. Michael Atiyah did not write undergraduate or basic textbooks, but Raoul Bott's book and *Characteristic Classes* and *Morse Theory* of John Milnor were so clear brilliant and beautiful that I turned to them for clarity on fundamental issues of geometry throughout my life.

Four-Sphere Theory could not even be conceived at all without their work and influence. They are like the air I breathed and I saw Nature through their concepts. They are the successors in my mind of Hermann Weyl and Bernhard Riemann, people who founded the concepts that now are part of my theory of mathematical physics.

2. WHY I KEEP FORGETTING THEM

I tend to forget about Atiyah, Bott and Milnor, and it is a psychological phenomena. It's because I have actually just internalised their textbooks and lectures throughout my student years, and having done that, I forget what is their innovation and what is like the air I breathe, the sun and stars, rivers and so on. But it was they who literally defined most of the concepts I employ without much thought in Four-Sphere Theory.