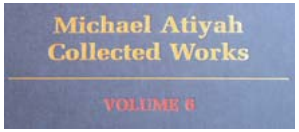
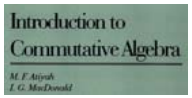


General structure

Atiyah's Collected Works (CW) so far consist of 6 volumes. Published by Clarendon Press at Oxford, Volumes 1 to 5 appeared in 1988 and volume 6 in 2004.

In the general Preface, which is included in each of the Volumes 1 to 5, the reader is informed that

> Essentially all my mathematical and quasi-mathematical publications are included here. The only exceptions are my textbook (with Ian Macdonald) on *Commutative algebra* and some articles which duplicate, identically or too closely, those published here. On the other hand I have included short articles, announcements of results or conference talks, which are later subsumed in larger papers. It seems to me that these still serve a useful purpose as a brief summary and introduction to the more technical papers.



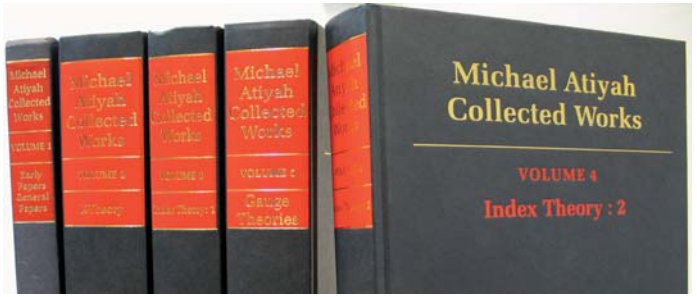
A very useful feature is that each volume contains a specific Commentary

> meant to fill in the mathematical backround by explaining the genesis of ideas and their mutual relation.

Allocation of the 173 titles in the volumes and number of pages of the corresponding Commentary (C)						
Volume	1	2	3	4	5	6
Papers	1-23	24-55	56-78	79-93	94-124	125-173
C	6	5	9	9	6	5

Title, number of papers and number of pages of the CW volumes				
CW	Title	# Papers	# Pages	Period
1	*Early papers*	9	184	1952-1958
	and general papers	14	174	1966-1985
2	*K-theory*	32	829	1959-1977
3	*Index theory: 1*	23	593	1963-1976
4	*Index theory: 2*	15	617	1973-1984
5	*Gauge theory*	31	685	1977-1985
6		49	1030	1986-2004

CW3 starts with the two papers (numbers 56 and 57) mentioned on the ***Early landmarks*** poster. Volume 6 has no title.



Surveys, essays and biographical portraits

The "quasi-mathematical papers" consist of crisp surveys and essays of different sorts. They are contained in CW1 (14 titles, about 225 pages) and in CW6 (23 titles, about 170 pages). In extension, these titles amount to a small fraction of the whole CW, but all of them provide more accessible entry points to the author's thinking than the more technical mathematical papers.

Among those 37 papers, 11 are biographical (*lato sensu*). Begining in CW1 with a masterly 24-page portrait of his doctoral supervisor, W. Hodge, it continues on CW6 with S. Donaldson, E. Witten, P. Dirac, F. Hirzebruch, R. Bott, R. Penrose, J. Todd, K. Kodaira and H. Weyl. The self-portrait (*A Personal History*) at the beginning of CW6 has been included in this count.

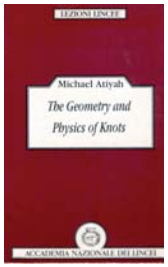
Mathematical works (A papers)

Of the 136 mathematical papers (*stricto sensu*) in CW, Atiyah is the single author of 69. For the remaining 67 there is at least one coauthor. In extension, they amount to about (A) 1600 pages and (B) 2200 pages, respectively.

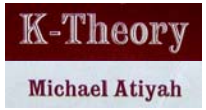
The distribution of the (number of) A and B titles across the CW volumes, together with the corresponding number of pages, is as follows:

CW	1	2	3	4	5	6
A	7 | 143	15 | 394	10 | 211	5 | 156	19 | 353	13 | 339
B	2 | 37	17 | 353	13 | 313	10 | 396	12 | 655	13 | 471

Among the A works there are five remarkable memoirs, which are also easier entry points to the corresponding topics than the more technical papers:



CW	Work	Title	# Pages
2	45	*K-theory*	171
3	78	*Elliptic operators on compact groups*	93
4	91	*Characters of semi-simple Lie groups*	66
5	99	*Geometry of Yang-Mills fields*	98
6	136	*The geometry and physics of knots*	85



Work 45 is the legendary *K-Theory* course of lectures given by Atiyah at Harvard in the fall of 1964 and published as a book by Benjamin in 1967 (the papers 44, *Power operations in K-theory,* and 43, *K-theory and reality*, were included as appendices). The last of the above five memoirs contains, among other things, a lovely axiomatic treatement of topological quantum field theory.

A sample of other outstanding A papers		
Paper	*Title*	*# Pages*
7	*Vector bundles over an elliptic curve*	39
46	*Bott periodicity and the index of elliptic operators*	46
58	*The index theorem for manifolds with boundary*	15
88	*Differential operators on manifolds* (CIME, Varenna, 1975)	43
118	*Magnetic monopoles in hyperbolic spaces*	34
127	*The logarithm of the η-function*	46

Atiyah's collaborators (B papers)

The first paper in CW6, *A personal history*, is meant to be "a personal account of the main features of my research" and "a description of the contributions made by my main collaborators, Hirzebruch, Bott and Singer". Excerpts:

> Some mathematicians or solitary individuals prefer to work peacefully on their own. I am not one of these. I prefer the lively give and take of mathematical discussions and arguments and I have spent much of my time in this way.
>
> I have been fortunate to have lived through two major revolutions, which have profoundly affected my research. The first, in the 1950's, was the introduction of new techniques in algebraic geometry and topology: sheaf theory, fibre bundles, characteristic classes, spectral sequences, etc. This revolution determined the direction of my work for twenty years.
>
> The second revolution was the impact of quantum field theory on geometry. This has been going strong for the past twenty years and is still in full swing.
>
> Is [Singer] was more of an analyst than my other collaborators [Hirzebruch and Bott] and from him I learnt about Fourier transform, Hilbert spaces and quantum mechanics. I could not have had a better partner for my involvement with the index theorem. Later, his contact with the physicists was one of the main openings for my involvement with the new physics/geometry interface — the second revolution.
>
> I should also acknowledge that I have been influenced by many other people including my students (Segal, Hitchin, Donaldson, ...), physicists (Witten, Penrose, ...) and analysts (Hörmander, Gårding, Connes, Bismut, ...).
>
> Very early on, when the algebraic geometry revolution was just starting, I was fortunate to have seen something of Serre. The breath of his interests, his taste and the elegance of his expositions had a marked impact on me. [Serre was awarded the first Abel Prize (2003)]

Atiyah's work with collaborators						
	CW2	CW3	CW4	CW5	CW6	Total
Hirzebruch	8 | 159	1 | 11				9 | 170
Segal	2 | 26	1 | 15			2 | 56	4 | 97
Singer		6 | 171		1 | 4		7| 175
Singer-Patodi			4 | 90			4 | 90
Singer-Donelly			2 | 41			2 | 41
Singer-Hitchin				2 | 39		2| 39
Bott-Shapiro	1 | 36					1 | 36
Bott	1 | 19	4 | 93		3 | 131		8 | 243
Bott-Patodi			1 | 56			1 | 56
Bott-Gårding			2 | 143			2 | 143
Hitchin				2 | 16	1 | 132	13 | 148
Hitchin-D-M				1 | 3		1 | 3
Manton					2 | 37	2 | 37
Sutcliffe					2 | 53	2 | 53
U	5|113[U2]	1|23[U3]	1|64[U4]	3|423[U5]	6| 194[U6]	16 | 819

U: Collaborators for a single paper. U2: Todd, Adams, Tall, Dupont, Smith; U3: Rees; U4: Schmid; U5: Ward, Jones, Pressley; U6: Jeffrey, Bielawski, Maldacena-Vafa, Witten, Berndt, Hopkins. D-M: Drinfeld-Manin.