Aviezri Fraenkel co-pioneered three very important parts of discrete mathematics: covering systems, combinatorial game theory, and information retrieval applied to sacred texts. None of these areas would be the same without his profound influence.

In covering systems, a very important sub-area of combinatorial number theory which formerly relied on analytical methods, together with Marc Berger and Alexander Felzenbaum, to whom he taught the subject, he developed a revolutionary and purely combinatorial approach that solved, very elegantly, many of the outstanding open problems in the area and that surprisingly often proved to be much more powerful and effective than analytical methods.

One striking example was their purely combinatorial proof of the famous $a[N] = a[N-1]$ theorem that asserts that every exact covering system (a set of pairs $(b[i], a[i])$, $i = 1, \ldots, N$, such that every integer n is congruent to $b[i]$ modulo $a[i]$ for exactly one i), then the two top moduli must be equal. In the early fifties, Davenport, Mirski, Newman, and Rado found an elegant analytic proof, but all attempts at an elementary proof were unsuccessful. The legendary Paul Erdös, in many of his talks, mentioned this as a paradigmatic example of a simple elementary statement that defies an elementary proof, and this was also a favorite of Ron Graham (EM 1994).

Fraenkel and his collaborators astounded the combinatorial number theory community, in the mid eighties, by giving such a combinatorial proof, that immediately led to a much stronger statement: the number of repeats of the top moduli is at least equal to the smallest prime that occurs in any of the moduli. Also very noteworthy are his papers with Jamie Simpson on square-avoiding words.

In combinatorial game theory, Aviezri Fraenkel can be considered the co-founder of the modern theory, along with Elwyn Berlekamp, John Conway, and Richard Guy. He also found amazing connections to other areas, like error-correcting codes. Just to cite one example, together with his former student Ya'acov Yesha, he developed an extremely elegant theory of annihilation games, as well as an extension of the Sprague-Grundy function to games whose digraphs may have loops. Fraenkel and collaborators also pioneered the important subject of the complexity of games, and proved the famous and often-quoted result which states that generalized chess, on an $n \times n$ board, is NP-hard. Also noteworthy were his periodic updates of a huge bibliography of the subject of Combinatorial Games, that is still useful today, but was a very important research tool in the pre-Google and pre-MathSciNet days.

Fraenkel also made forays into computational biology, in particular protein-folding, and was quoted in the New York Times as saying that "Nature is somehow more powerful than a digital computer". With the late Joe Gillis, back in 1966, he used Eulerian graphs to solve a problem in what is now called bio-informatics.

Nowadays, everyone takes computers for granted and when we search via Google ar MathSciNet for a scholarly item, we don't think about it. Even social scientists, lawyers, theology professors, and clerics of all religions, do computerized literature searches routinely, but this was not always the case.

Back in the early early sixties, Aviezri already realized the great potential of computers for legal, theological, and general humanities research, and fought tooth and nail, against the natural orthodoxy of these fields, to convince them of the great potential of computers. Finally, he won the battle,, but it wasn't easy! His Responsa project, which is an extremely large database of decisions and interpretations by authorities in the Jewish religion and its sacred texts, was selected, by the State of Israel, in its 5oth anniversary in 1998, to be one of the top fifty projects in the whole of the State of Israel's first fifty years.

Aviezri, who was born in 1929, continues to be as active as ever! Just go to his homepage, and you will see lots of intriguing and original very recent contributions.