

In the year 10,191 after the fall of the machine titans, and the universe is dominated by the presence of the spice Melange which extends life, expands consciousness, and can fold space. It exists in only one place: the desert planet of Arrakis, also known as Dune.

The inhabitants of Dune, the nomadic people called the Fremen, have a legend that tells of the coming of a messiah from another world. The Emperor of the known universe Shaddam IV (Jose Ferrer) becomes concerned that the House of Atreides on the planet Caladan is becoming too powerful and plots with their enemies, the House of Harkonnen, to allow the Duke of Atreides (Jurgen Prochnow) to guard Dune and its spice ore, and to launch an attack against Caladan. Paul Atreides (Kyle MacLachlan) the Duke's son, cannot understand why the Harkonnen would have given up their presence on Arrakis, but understands that the family must go to Caladan nonetheless. Paul's mother, Lady Jessica Atreides (Francesca Annis), is a Bene Gesserit, of a secret order of women regarded by some as witches. Their Reverend Mother (Silvana Mangano) tests Paul's strength by exposing him to horrible pain. She tells him about the Water of Life, bile from the giant Arrakis worms, which no man has ever drunk, and survived. Only the Kwisatz Haderach, the true messiah, whom the Fremen inhabitants believe, can drink it.

Meanwhile, on the planet Geidi Prime, the industrial homeland world of the Harkonnen, the mad Baron Vladimir Harkonnen (Kenneth McMillan) plans his personal revenge against Atreides by finding a traitor who will kill the Duke and assigns his nephews Feyd (Sting) and Raban of the task of crushing the House of Atreides. The Harkonnen invade Caladan and the traitor Dr. Wellington Yueh (Dean Stockwell) attacks the Duke. Yueh agrees to spare the lives of the pregnant Jessica and Paul if the Duke breathes poison gas into the face of the Baron. The Duke agrees but fails in doing so, leading to the Baron killing him and sending Jessica and Paul to Arrakis to be in exile, but they soon escape from their captors.

Paul and Jessica reach the mountains and find a tribe of Fremen who give them sanctuary. When the Fremen think that Paul and Jessica are the Kwisatz Haderach they have come to believe, Jessica drinks the Water of Life, which she goes into convulsions, her eyeballs bleed, and awakens her eyes a shining blue and with sudden strength and knowledge. Jessica's daughter Allia (Alicia Witt) is born prematurely, but has the same blue tinted eyes as she and, in the time it takes Paul to train the Fremen, grows into a young girl with great powers. Allia and Paul, (who takes the name of Maud'Dib) teach the Fremen how to fight, and they begin a war to stop the flow of the spice. Paul then drinks the Water of Life and emerges the same blue-eyed-tinted super-human as the Fremen believe as the messiah, who then leads his group to launch an attack against the Harkonnen.

The Emperor travels to Dune and meets the Baron, who has decapitated his incompetent nephew Raban. Allia is brought in where she brings to them a message about Paul coming for all of them. Suddenly, Paul and the Fremen attack the fortress with the support of the giant Arrakis worms. Allia then kills the Baron and escapes to join Paul's forces. After fierce battle, the Fremen capture the fortress and the Emperor and his staff are captured.

Afterward, Paul confronts the captive Emperor where he is challenged by the psychotic Feyd to a duel with daggers. Paul accepts and wins, stabbing Feyd in the neck. As Paul, Jessica and Allia embrace celebrating their victory, storm clouds gather and it begins raining on Arrakis for the first time.