2000 –2002 **2 ½ years on a postdoctoral position** won through an international competition at **Weizmann Institute of Science WIS Rehovot, Israel**, "The Edmond I. & Lillian S. Kaufman Postdoctoral Fellowship".

I collaborated with **Professor Michael Hass** (lab CEO) and with **Professor Michael Paul** (from the Racah Institute of Physics, Hebrew University, Jerusalem) for:

- a)Pelletron 14MV, on multiple problems de Accelerator Mass Spectrometry:
  - *-Towards a measurement of the cross section for $^{3}He(^{4}He,\gamma)^{7}Be$ with Accelerator Mass Spectroscopy (AMS)*,
  - *-Experimental limit to interstellar ^{244}Pu abundance,*
  - *-Be-10 measurements on Neolithic and Paleolithic flint tools from Israel,*
  - *-An insight into Pu-244 abundance in interstellar matter,*
  - *-Counting Ti-44 nuclei from the Ca-40(α,γ)Ti-44 reaction,*
  - *-A window on nucleosynthesis through detection of short-lived radionuclides,*
  - *-Flint mining in prehistory recorded by in situ-produced cosmogenic Be-10,*
  - *-Magnet saturation and relativistic effects in accelerator-mass-spectrometry systems,*
  - *-Upgrading of the AMS facility at the Koffler 14UD Pelletron accelerator*

  Many such publications came out of this period of time (see the publication list).

- b)at the 3MV Van de Graaff accelerator, on 3 issues for Nuclear Astrophysics
  - b1) astrophysical factor measurement $S_{17}(0)$ for the nuclear reaction $^{7}Be(p,\gamma)^{8}B$ responsible for the most energetic neutrinos coming from our Sun:
    - *-A new measurement of the proton capture rate on ^{7}Be and the $S_{17}(0)$ factor,*
    - *-Precision measurement of the $^{7}Be(p,\gamma)^{8}B$ cross section with an implanted ^{7}Be target,*
    - *-A new measurement of the proton capture rate on Be-7, New measurement of the proton capture rate on Be-7 and the S-17(0) factor*
  - b2) astrophysical factor measurement $S_{34}(0)$ for the nuclear reaction $^{3}He(^{4}He,\gamma)^{7}Be$ responsible for the ^{7}Be neutrinos, with the goal of normalizing all other previous results for this astrophysical factor:
    - *-Towards a measurement of the cross section for $^{3}He(^{4}He,\gamma)^{7}Be$ with Accelerator Mass Spectroscopy (AMS),*
    - *-Next steps on the cross section measurement for the fusion reaction $^{4}He(^{3}He,\gamma)^{7}Be$.*

I did the **design and the commissioning of the reaction gas-chamber,** used to study the nuclear reaction $^{4}He(^{3}He,\gamma)^{7}Be$, and **I established the experimental method**

for this measurement. In the end of my position there, I could test the chamber while running a preliminary experiment $^{4}He(^{3}He,\gamma)^{7}Be$ at the 3MV accelerator.

I learned to perform **AMS (Accelerated Mass Spectrometry) measurements in Professor Michael Paul's group**, from Racah Institute of Physics from Hebrew University, Jerusalem. Here is what I did:

- **Chemical separation method** of the ^{7}Be nuclei from the implantation metal Cu (the method was a result of a collaboration with chemist Chana Feldstein from the Racah Institute of Physics, Hebrew University, Jerusalem)
- **Method to obtain standard probes for the AMS** for the ^{7}Be nuclei (method resulted from collaboration with Professor Michael Paul)
- Data analysis for the ^{7}Be counting through the AMS method.

o b3) study the nuclear reactions which may destroy ^{7}Be si ^{7}Li in our Sun

- I participated at Yale University, Connecticut, USA, to an USA-Israeli-Belgian cooperation experiment for Nuclear Astrophysics (spoke-person Professor Moshe Gai):
- *-Destruction of Li-7 and Be-7 in astrophysical environments*.

c) At ISOLDE, CERN, Geneva, I participated to a nuclear magnetic moment measurement (spoke-person Professor Michael Hass):

- *Magnetic moment of Ne-17 using beta-NMR and tilted foil polarization*

Activity results from this period were presented at renowned schools, such as:

- *Erice school: the 22nd School on Radioactive beams in Nuclear and Astro Physics (2000), Sicily, Italy,*
- *Santa Tecla, Sicily, Italy : The 1st European Summer School on Astrophysics (2001),*
- *TRIUMF, Vancouver BC, Canada (2002) : SNIT 2002, Summer Nuclear Institute at TRIUMF 2002, June 10-21, 2002*

and at international conferences, as:

- *AMS (see the publication list)*
- *-Carbon-dating (2000) (see the publication list)*
- *-Nuclear Astrophysics (see the publication list)*.

When I worked at **WIS,** for the **AMS,** I accomplished:

- Carrying out the method of AMS detection of the ^{7}Be nuclei (and perfecting it), which allow counting the atoms created in the reaction ^{3}He +^{4} He (see list of publications).
- I worked in chemistry labs from WIS and from the Hebrew University to determine the chemistry to be used for the preparation of ^{7}Be probes for AMS.

- I participated in the completion of the computerized control of the 14MV Pelletron AMS, using LabVIEW, and to its technical implementation (see list of publications).
- I did relativistic calculations to calibrate the analyzing magnet from Pelletron for the case of relativistic heavy ion experiments AMS done at the time (see list of publications).

For the **Nuclear Astrophysics**, at **WIS**, I accomplished two big activities at the accelerator Van de Graaff of 3 MV:

- for the p+^{7}Be experiment
    - up-grading the existing experimental set-up
    - Participating in the experimental group to fulfill the experiment
- for the ^{3}He+^{4}He experiment
    - gas-target chamber construction, starting with designing and testing it
    - the whole experimental assembly and method testing by running a preliminary experiment for the ^{3}He+^{4}He experiment.