# ARIE ZIGLER

Date of Birth: 20 June 1946.

Citizenship: Israel

Phone: +972 26585157

e-mail: zigler@vms.huji.ac.il

Hebrew University

 **Department:** Racah Inst. of Physics, Hebrew University, Jerusalem, Israel

 **Homepage:** <http://www.phys.huji.ac.il/~zigler/>

**Abstract**: Dr. Zigler has more than 30 years of experience in experimental physics in area of electro-optics, spectroscopy, high power lasers , plasma physics, interaction of high intensity, ultra short pulse laser with matter. He holds a Chair of Physics at Faculty of Science of Hebrew University in Jerusalem and is a Full Professor at Racah Institute of Physics at Hebrew University of Jerusalem. Dr. Zigler has published over 180 scientific publications , delivered numerous invited talks at scientific conferences and holds 10 patents. He is a fellow of American Physics Society.

**Academic Degrees**

1968 - 1971: B. Sc. - Hebrew University , Jerusalem , Israel.

1972 - 1974: M. Sc. - Hebrew University, Jerusalem , Israel.

1975 - 1978: Ph.D. - Hebrew University, Jerusalem , Israel.

**Academic Appointments:**

1978- 1981 Senior Researcher Soreq Research Center Israel, Group Leader of XUV and X-ray spectroscopy experiments

1981-1982 Senior Scientist INESCO Tokamak project San Diego Ca, USA Responsible for diagnostics package for compact Tokamak experiment.

1982 -1983 Visiting Scientist, Plasma Fusion Center, M.I.T, Cambridge MA, USA Developed K alpha diagnostic for Alcator C Tokamak

1983- 1985 Head of Experimental Plasma Branch, Soreq NRC Israel Dealt with theoretical and experimental study of spectroscopy of highly ionized heavy atoms

1985 Visiting Scientist, Lawrence Livermore National Laboratory, USA. Study of interaction of high power laser and developed point backlighting source for fusion studies

1986- 1987 Visiting Scientist, Dept. of Physics, University of California, Berkeley, USA. Introduce ultra fast switching X-ray radiation

1987-1991 Head of Plasma Physics Department, Soreq Research Center Israel. Leader of R&D activities of 20 Ph.D researchers in the fields of laser-plasma interactions, X-ray radiation, shockwave phenomena and nonlinear optics. The application of one of methods is widely used for interpretation of laser-produced plasma experiments as well as of radiative properties of stellar plasmas is highly cited (above 220).

1991- 1992 Senior Physicist, ARCO Power Technologies, Inc., Washington DC, USA. Was responsible for physics aspects of design and development of airborne laser-optical instruments for detection oil films and trace elements in water. The work has led to two patents.

1992- 1995 Associate Professor, The Racah Institute of Physics, Hebrew University of Jerusalem. Leader of research group, deals with interaction of ultra short laser radiation with solids, laser wake field acceleration in plasmas, and x-ray lasers.

1995- present Full Professor, The Racah Institute of Physics of Physics, Hebrew University Main activities are in the field of electron and proton acceleration. More than 30 publications related electron accelerations were published and widely cited (more than 200), intense laser propagation in the atmosphere. Our works on laser filamentation the atmosphere are also highly cited.

2000- 2001 Senior Researcher, Naval Research Laboratory /FMtech, Washington DC. Dealt with interaction of ultra short pulse laser with solid targets (sabbatical)

2006-2007 Senior Researcher, Naval Research Laboratory/Icarus, Washington DC Development of capillary discharges for intense laser guiding (sabbatical)

2007 Louis and Ida Shlansky Chair of Physics at Faculty of Science, Hebrew University

 of Jerusalem

2012- Visiting Professor University of Maryland, College Park Maryland, USA

**Fellowships**

2000 - Fellow American Physics Society - In recognition of his fundamental experimental contributions to the field of ultra high intensity laser matter interactions

**Current International activities**

Member of SILMI (Super Intense Laser Matter Interaction)

Member of COST program

Member of Editorial board High Power Laser Science and Engineering, Chinese Laser Press/Cambridge Press

1. ***Top 10 peer-reviewed publications in related fields (the last 10 years)***
2. Conversion of Electrostatic to Electromagnetic Waves by Super-luminous Ionization Fronts. D.Hashimshony, A.Zigler and D.Papadopoulos. Phys.Rev.Lett. 86, 2806, 2002
3. [Cohesive acceleration and focusing of relativistic electrons in overdense plasma](http://wos4.newisiknowledge.com/CIW.cgi?SID=P56Zlgrg-GkAAD8OcCo&Func=Abstract&doc=1/3) Yakimenko V, Pogorelsky IV, Pavlishin IV, H.Hirose and A.Zigler Phys.Rev.Lett 91. 014802 2003
4. [From quantum ladder climbing to classical autoresonance](http://wos4.isiknowledge.com/?SID=QX6CvArg-GkAABDydp8&Func=Abstract&doc=1/2). Marcus G, Friedland L, Zigler A Phys. Rev. A 69, 013407 2004
5. [Control of multiple filamentation in air](http://wos15.isiknowledge.com/?SID=ObB2h@4knNca47e1Cnc&Func=Abstract&doc=1/6)  Fibich G, Eisenmann S, Ilan and A.Zigler Opt. Lett. 29 1772-1774 2004
6. [Self-focusing distance of very high power laser pulses](http://wos02.isiknowledge.com/?SID=Z1biMeeahji@B@eafh@&Func=Abstract&doc=1/5)  Fibich G, Eisenmann S, Ilan B, and A.Zigler Optics Express. 13, 5897, 2005
7. [Fine structure of a laser-plasma filament in air](http://apps.isiknowledge.com/WoS/CIW.cgi?SID=P2PjJ3lCd2lHchiPl1k&Func=Abstract&doc=2/1)  Eisenmann S, Pukhov A, Zigler A Phys.Rev.Lett 98 155002 , 2007
8. [Generation of controlled radiation sources in the atmosphere using a dual femtosecond/nanosecond laser pulse](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=X2KjjCKpgH384L81E3F&page=1&doc=2&colname=WOS) Henis, Z; Milikh, G; Papadopoulos, K and A.Zigler J. APPLIED PHYSICS    103,    103111,  2008
9. [Effect of an energy reservoir on the atmospheric propagation of laser-plasma filaments](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=X2KjjCKpgH384L81E3F&page=1&doc=3&colname=WOS) Eisenmann, S; Penano, J; Sprangle, P, and A.Zigler Phys.Rev.Lett 100,    155003,   2008
10. [5.5-7.5 MeV Proton Generation by a Moderate-Intensity Ultrashort-Pulse Laser Interaction with H2O Nanowire Targets](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=R2g5nIJ4aOk@5MobaNf&page=1&doc=2&colname=WOS) Zigler, A; Palchan, T; Eisenmann,S, Button M, ShlieferE and D. Gordon Phys.Rev.Lett  106, 134801, 2011
11. [Enhanced proton acceleration by an ultrashort laser interaction with structured dynamic plasma targets.](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=Z13n3AHIIaHHj8BllHM&page=1&doc=1)  Zigler, A; Eisenman, S; Botton, M; et al. Phys. Rev. Lett.110 215004    2013

 ***Selected Invited Presentations at International Conferences***

1. 2007 International Symposium on Laser-Driven Relativistic Plasmas Applied for Science, Industry and Medicine, Kansai Photon Science Institute, Japan, Sept 2007
2. 2007 16th International Laser Physics Workshop León, Mexico
3. 2008 2nd International Symposium on Filamention Paris, France
4. 2008 The XIII International Conference "Laser Optics 2008". St.Petersburg, Russia
5. 2009 Extreme Light Infrastructure *:*Grand Challenges Meeting*,* Pars France
6. 2009 The Sixth International Conference on Inertial Fusion Sciences and Applications
7. 2010 Advanced Accelerator Concept Workshop Annapolis MD, USA
8. 2010 3rd International Symposium on Filamentation Crete, Greece,
9. 2010 Conference on “Superstrong Fields in Plasma” Varenna, Italy
10. 2011 The 31st International Workshop on Physics of High Energy Density in Matter Waldemar-Petersen-Haus, Hirschegg, Austria
11. 2011 ELI-Beamlines Scientific Challenges Prague 2011
12. 2011 Light at Extreme Intensities (LEI 2011), Szeged, Hungary
13. 2012 Advanced Accelerator Concept Workshop Austin Tx, USA
14. 2012 Conference on High Intensity Laser Interaction, Jerusalem, Israel

 **Research expeditions**

Leader of several collaborative experiments including in the frame of European LASERLAB project.

1. Electron acceleration using capillary discharges – LULI Ecole Polytechnique 1999
2. X-ray laser using channelling – Max Born Institute 2001
3. Guiding Ultra \high laser Intensities - Max Born Institute 2003
4. Proton Acceleration using nano wire targets APRI*,* Gwangju Inst.
5. of Sci. & Technol., Gwangju, South Korea 2010
6. Proton acceleration from snow targets Max Born Institute Berlin 2011-2013
7. Proton acceleration, Texas PW Laser , Univ. Texas , Austin USA 2013

**Organisation of International workshops and conferences**

French Israeli Symposium on Non linear Optics 2000- 2013

( advisory committee, permanent)

Annual meeting of Israel Physical Society, Jerusalem, Israel – 2001 (meeting coordinator)

Conference on “Superstrong Fields in Plasma” Varenna, Italy - 2010 (program committee)

 3rd International Symposium on Filamentation Crete, Greece, 2010 (program committee)

Conference on High Intensity Laser Research, Jerusalem, Israel -2011 (meeting coordinator and chair)

4th International Symposium on Filamentation Tucson, Arizona 2012 (program committee)

Conference on High Intensity Laser Interaction, Jerusalem, Israel -2012 (meeting coordinator and chair)

Conference on High Intensity Laser Interaction, Jerusalem, Israel -2013 (meeting coordinator and chair)

**Major contributions to early careers of excellent researchers**

During my academic career I have mentored and stimulated 20 M.Sc and 15 PhD young researchers. They have integrated into various academic as well as hi tech positions. In particular Dr. G. Marcus, Dr. Y. Erlich, Dr. M.Fraenkel, Dr. M.Inon, Dr.Y.Glick are holding faculty positions in universities and permanent research positions in research institutions in Israel. Dr. D.Kaganovich holds a permanent position as Senior Researcher at Naval Research Lab at Washington DC, USA. Dr.D.Hashimshony, is the founder and President of Dune Inc. Dune Medical Devices is a privately held company with offices in the US, Israel and Switzerland and employs tens of young researchers in Israel including my former students like Dr.I.Getner. Dr.S.Eisenman is a founder and CEO of HIL Medical Inc a start up company that employs several young researchers. My current group includes 4 PhD students and 3 M.Sc students. Annually, few undergraduate honor students perform independent research in my laboratory in conjunction with ongoing research projects.

Main Scientific Contributions

 **Origin of K-alpha radiation in laser produced plasma**. During his Ph.D work he has found that the origin of K-alpha radiation in laser produced plasma is due to the presence of hot electrons deviated from the thermal distribution (ref 4). This method is widely used today by many laser produced plasma labs for measuring fast electrons.

**Spectroscopy of heavy highly ionized atoms.** In later years his research was focussed on the study of spectra emitted by highly ionized heavy ions. In particular a complex spectra emitted by the heavy, highly ionized atoms were collected and analyzed by calculating the bound-bound emission from a local thermodynamic equilibrium plasma. The total transition array of a specific single-electron transition, including all possible contributing configurations, was described by only a small number of super-transition-arrays (STA’s). The method allows interpolating smoothly between the relatively simple average-atom (AA) results and the detailed configuration accounting that underlies the unresolved transition array method. It was shown that under certain plasma conditions the contributions of low-probability transitions can accumulate into an important component of the emission. In these cases, detailed configuration accounting is impractical. On the other hand, the detailed structure of the spectrum under such conditions is not described by the AA method. The application of the STA method is widely used for interpretation of laser-produced plasma experiments as well as of radiative properties of stellar plasmas. (see ref 9,12,14,17,23,30,31,37,39,43,57) . Some of the publications were highly cited (above 220).

**Guiding of ultra high laser intensities by plasma channels – electron acceleration.**

The next major contribution was development of ablative capillary discharges. This approach was used as X-ray laser medium (ref 46, 52, 54,62, 75 and 148). In parallel in 1996 these slow capillary discharges were used for demonstration of optical guiding of a high intensity, up to 1019W/cm2 laser pulses in a long (up to 25cm) cylindrical plasma capillary channel. Optical guiding in a curved plasma (radius of curvature = 10 cm) was also demonstrated. Results show guiding of many tens of vacuum diffraction lengths in both straight and curved channels, in agreement with theory and simulation. In 2000 these channels were proposed as medium for achieving multi-GeV electron energies in the laser wakefield accelerator (LWFA) since it is necessary to propagate an intense laser pulse long distances in plasma without disruption. It was shown that electron energies of similar to GeV in a plasma-channel LWFA can be achieved by using short pulses where the forward Raman and modulation nonlinearities tend to cancel. Further energy gain can be achieved by tapering the plasma density to reduce electron dephasing. It was also demonstrated that energy depletion can be overcome using multistage capillary discharges. More than 30 publications in the related subjects were published and widely cited, for example ref 88 was cited more than 200. In the recent years a modified version of the capillary discharge was used by other group for the experimental demonstration of electron acceleration above GeV.

**Conversion of Electrostatic to Electromagnetic Waves by Super-luminous Ionization Fronts –Generation of THz radiation.**

Another area of investigation was a new approach for generation of THz radiation.It was achieved by the conversion of static electric fields to electromagnetic radiation by the incidence of a superluminous ionization front on plasma. For extremely superluminous fronts, the radiation is close to the plasma frequency and is converted with efficiency of order unity. A proof-of-principle experiment was conducted using semiconductor plasma containing an alternately charged capacitor array. The process has important implications in astrophysical plasmas, such as supernova emission, and to laboratory development of compact, coherent, tunable radiation sources in the THz range. Tunable radiation in the range from 0.1 to a few THz by the interaction of a superluminous photoconducting front with an electrostatic 'frozen wave' configuration in a semiconductor is reported. The interaction converts the energy contained in the 'frozen wave' into THz radiation, whose frequency depends on the energy in the laser pulse creating the superluminous front and the wavelength of the static wave. Power scaling as a function of the electrostatic 'frozen wave' energy was obtained. The capability of the concept to act as a narrow or wideband, tunable and powerful THz source was demonstrated. Using THz source we have measured the dielectric properties and thickness of thin semiconductor epitaxy layers by the reflection of THz radiation from the surface of a two-layered semiconductor wafer. The reflection from two interfaces the electromagnetic pulse has a destructive interference at a specific wavelength dependent on the thickness of the outer layer and its dielectric function. Near that frequency the reflection coefficient has a significant drop. By extending the incident pulse spectrum to include this interference frequency, a measurement of the thickness was obtained together with a direct measurement of the carrier number density. By this technique epitaxy layers of thickness down to a few microns were characterized (ref 103,110,111,114,121,122,126).

**Propagation of high laser intensities in atmosphere.**

Propagation of high power femto-second laser pulses in the atmosphere has been observed to self-channel in air and to propagate as narrow light filaments over distances from several tens to several hundreds of meters. This propagation is the result of a dynamical equilibrium among many effects, including Kerr self-focusing, diffraction and plasma defocusing. For laser intensities of 5x1013 W/cm2 a plasma column with electron density of 1016 - 1017 cm-3 is created in the wake of the self-guided pulse. We have proposed a simple method that allows obtaining a single and highly stable filament, out of a high-power pulse which would otherwise generate a random multiple filamentation patterns. We also have demonstrated that the location of the initial air breakdown can be controlled by forming stable filamentary structures in air due to the replenishment phenomena. The developed control techniques produced very stable single or multiple filaments with an angular stabilityof 10-5rad. The ultra-short (femtosec) lasers can generate plasmas at desired locations and distances of several km in the atmosphere, the lifetime of the plasma plume is too short to be of interest because of limits in the pulse energy. The ultra-short (femtosec) lasers are not sufficiently powerful to initiate air breakdown at distances of several kilometers in the atmosphere. A new approach based on the use of a combination of ultra-short pulse laser and a long pulse laser was developed. The ultra-short pulse is deployed first to create ionized channel at desired location by multi-photon ionization. It is then followed by a long pulse that maintains the plasma channel at a controlled temperature level. This technique can generate plasma channels remotely at realistic timescales for the development of leader stroke with controlled characteristics of ionized filaments generated launched into the atmosphere with many applications, among which the two most spectacular are lightning control and laser-assisted water condensation. Ref. 142,153,162,167,168, 177. The works on laser filamentation are highly cited.

**Proton acceleration**

Laser powered acceleration of protons is considered to be a key technology in the development of compact source for hadron therapy of cancer. An advanced concept for proton acceleration based on the field enhancement by micro-structures was proposed ref 165,166 . The target exhibits an enhanced absorption of laser energy by snow deposited on Sapphire targets. Using modest level ultra short laser facility (<1018W/cm2) and snow deposited targets, my group has demonstrated production of 10MeV protons ref 173 and recently using more powerful system 25MeV ref 182. This points to an order of magnitude increase of the maximal proton energy (namely to 100MeV level) with high intensity lasers of 5∙1019 W/cm2). We also have shown that the scaling laws of the protons energy is similar to the TNSA-scheme, but shifted to lower laser energies. This pioneering work proved that protons can be accelerated by modest energy lasers, with all the important implications to possible future realizations.

**List of Publications**

1. Spatial Resolution of X-ray Line Emission in Laser-Produced Plasma by the Shadow Technique. A. Zigler, H. Zmora and Y. Komet, Phys. Lett. **60A**, 319 (1977).
2. Expansion of Laser Produced Al Plasma and Heat Penetration Depth in Multi-Layered Targets. A. Zigler, H. Zmora, Y. Paiss and J. L. Schwob, J. of Physics **D10**, L 159 (1977).
3. Experimental and Theoretical Studies of Laser Produced Plasmas at the Soreq Nuclear Research Center, D. Salzmann, Y. Gazit, Y. Komet, M. Loebenstein, H.Szichman, A. Zigler, H. Zmora, Laser Interaction and Related Plasma Phenomena, Vol. 4A, P. 407-415. Edited by H. J. Schwarz and H. Hora, Plenum Publishing Corp., 1977.
4. The Origin of K­ Radiation in Laser Produced Al Plasma, A. Zigler, H. Zmora, H. M. Loebenstein and J. L. Schwob, Phys. Lett. **63A**, 275 (1977).
5. Investigation of the Transient Ionizing Regime for Laser Produced Plasma, A. Zigler, H. Zmora, H. M. Loebenstein and J. L. Schwob, J. Appl. Phys. **50**, 165 (1978).
6. Burn-Through of Thin Aluminum Foils by laser Driven Ablation, A. Zigler, H. Zmora, B. Arad, S. Eliezer, Y. Gazit, H. M. Loebenstein, andS. Zweigenbaum. J. Appl. Phys. **50** (11), 6817 (1979).
7. Spectra of Highly Ionized Cr, Fe, Co and Ni Emitted from Laser Produced Plasmas,
N. Spector, A. Zigler and H. Zmora, J.Opt. Soc. Am. **67,** 1289, (1978).
8. Cr, Co and Ni Transitions Isoelectronic to the Fe XXIV-Fe XVII Lines Around 11 A in Laser Produced Plasma, N. Spector, A. Zigler and H. Zmora, J. Opt. Soc. America, **70**, 857, (1980).
9. Identification of the Spectra of Hf XLV , Ta XLVI, W XLVII and Re XLVIII Isoelectronic to Ni in Laser Produced Plasmas, A. Zigler, H. Zmora, N. Spector, M. Klapisch, J. L. Schwob and A. Bar-Shalom, J. Opt. Soc. Am. **70**, (1) 129 (1980).
10. A Q-Switched Oscillator for Stable Time-Tunable Operation in the Nanosecond Regime, S. Jackel, H. M. Loebenstein, A. Zigler, H. Zmora and S. Zweigenbaum, J. Phys. E **13**, 995 (1980).
11. Z Dependent Absorption and Stimulated Backscatter Processes in Laser Produced Plasma, S. Jackel **.** H. M. Loebenstein, A. Zigler H. Zmora and S. Zweigenbaum, Appl. Phys. Lett. **36** (1), 34 (1980).
12. Nickel-Like X-Ray Spectra of Laser Produced Platinum Plasma, A. Zigler, H. Zmora, N. Spector, M. Klapisch, J. L. Schowb and A. Bar-Shalom, Phys. Lett. A **75**, 343 (1980).
13. Effect of Pulse Duration and Polarization on Momentum and Energy Transfer to Laser Irradiated Targets, B. Arad, S. Eliezer, S. Jackel,A. Zigler, H. Zmora and S. Zweigenbaum, Phys. Rev. Lett. **44** (5), 326 (1980).
14. Nickel-Like Spectrum of Tm XLII and Yb XLIII from Laser produced Plasma, A. Zigler,M. Klapish et al.,Phys. Lett. A**79**. 67 (1980).
15. Laser-Light Absorption in long-Pulse High-Irradiance Experiments, B. Arad, S. Eliezer, Y. Gazit, S. Jackel, Y. Karmi and A. Zigler. Appl. Phys. Lett. **37** (9), 7 **(**1980).
16. Effect of Ponderomotive Forces on Wave Dispersion and Second-Harmonic Light Emissions in Laser Produced Plasmas, S. Jackel, S. Eliezer and A. Zigler, Phys. Rev. A **24** (3), 1601, (1981).
17. Identification of 3d-4p Transitions in Co-Like W XLVIII and Tm XLIII and in Cu-Like W XLVI and Tm XLI From Laser Produced Plasmas, Klapisch, P. Mandelbaum , A. Bar-Shalom, J. L. Schwob , A. Zigler and S. Jackel, J. Opt. Soc. Am. **71**, (10), 1267, 1981.
18. Pulse-length Polarization and Z. Dependent Properties of Laser Produced Plasmas at High Irradiances, S. Jackell B. Arad, S. Eliezer, Y. Paiss, N. Spector, A. Zigler, H. Zmora and S. Zweigenbaltm, Laser Interaction and Related Plasma Phenomena, Vol. 5, 524-532, 1981 Edited by H. J. Schwartz, H. Hora, M. Lubin and B. Yaakobi , Plenum Publishing Corp. 1981.
19. Temporal Pulse-Shaping for Laser Fusion Experiments Using a Cavity Dumped Q-Switched Oscillator, S, Jackel, R. Lalluz, Y. Paiss, S. Eliezerand A. Zigler, J. Phys. E: Sci. Instrum. **15**, 255, (1982).
20. Multistep Laser Pulse Generation Using Passive Electrical Networks in the Driver of A Cavity-Dumped Q-Switched Oscillator. S, Jackel, R. Lalluz, Y. Paiss, S. Eliezerand A. Zigler, J. Phys. E: Sci. Instrum. **15,** 670, (1982).
21. High Irradiance Studies of Laser-Produced Plasma, S. Jackel, R. Lalluz, Y. Paiss, S. Eliezerand A. Zigler, Proceedings of Fusion Energy, **5.** p. 141-152, IAEA-SMR-82.
22. Recent Experiments on Laser-Plasma Interaction Carried Out at Soreq S. Jackell B. Arad, S. Eliezer, Y. Paiss, N. Spector, A. Zigler, H. Zmora and S. Zweigenbaltm. Les Houches Session XXXIV, p. 51-62, Ed. R. Balian and J. C. Adam, North Holland Publishing Co., 1982.
23. Interpretation of Unresolved Transition Arrays in the Soft X- Ray Spectra of Highly IonizedMolybdenum and Palladium, M. Klapish, E. Meroz, P. Mandelbaum and A. Zigler, Phys. Rev. A **25**, 2391 (1982).
24. Rationalization of Diagnostics Selection. B. G. Buss and A. Zigler, INESCO Internal Report No.80-12/06, 1982.
25. Periodically Pulsed Thompson Scattering, A. Zigler, INESCO Internal Report No. 81-11/51, 1982.
26. Ion Temperature Measurements, A. Zigler, INESCO Internal Report No. 82-04/18, 1982.
27. Ion Temperature Measurements II (High Temperature Region), A. Zigler, INESCO Internal Report No. 82-04/62, 1982.
28. Visible Spectroscopy of Tokomak Diagnostics. A. Zigler, INESCO Internal Report No. 82-04/19, 1982.
29. X- Ray Spectrometer for Bremsstrahlung Measurements, A. Zigler, INESCO Internal Report No. 82-06/26, 1982.
30. Classification of X-Ray Spectra from Laser Produced of Atoms from Tmto Pt in the Range 6-9A, A. Zigler, H. Zmora, P. Mandelbaum, M. Klapisch, J. L. Schowb and A. Bar-Shalom Physica Scripta **27**, 3953 (1983).
31. Classification of Cu-I like 3p-4s and 3p-4d Transitions in X-Ray Spectra, A. Zigler, H. Zmora, P. Mandelbaum, M. Klapisch, J. L. Schowb and A. Bar-Shalom, Phys. Lett. A **92**, 84 (1983).
32. X-Ray Transmission Spectrometer for Ion Temperature Measurement. A. Zigler, E. Marmar, J. Rice and J. Terry, MIT Internal Report , 1983.
33. Survey Spectrometer f or X -Ray Emission from Tokomak**,** A. Zigler, E. Marmar, J. Rice and J. Terry, MIT Internal Report, 1983.
34. Review of Recent Experimental and Theoretical Laser-Plasma Reseach Carried Out at Soreq., S, Jackel, R. Lalluz, Y. Paiss, S. Eliezerand A. Zigler, Laser Interaction and Related Plasma Phenomena, Vo. 6. p 351-364 ed. by H. Hora and G. M. Miley, Plenum Publishing Corp. 1984.
35. Deposition of energy outside of the focal spot as observed on the rear surface of laser irradiated targets. A. Zigler, M. Givon, A. Lyudmirski, S. Eliezer and M. Kishenevsky. Phys. Lett., A **112** (5), 223, (1985).
36. Acquisition and processing of optical two-dimensional Transients, M. Kishenevsky, A. Zigler and A. Arad, J. Phys. E: Sci. Instrum. 19, 864 (1986).
37. The unresolved 3d-4f transitions in the x-ray spectra of highly ionized Tm to Re from laser produced plasma. M. Klapisch, P. Mandelbaum, and A. Zigler, Phys. Scrip. **34**, 51-57 (1986).
38. Laser generated shock wave velocity measurements using visible backlighting techniques. A. Zigler, A. Ludmirsky, A.Borowitz, E.Moshe, S.Eliezer,Y.Pais, D.Saltzman and H.Zmora, J. Phys. E **19**, 309-311 (1986).
39. Multiple open shell x-ray spectra in laser irradiated W and Au plasmas. A. Zigler, M. Klapish, and P. Mandelbaum. Phys. Lett. 111, **31** (1986).
40. Identification of lines of ions belonging to the F I isoelectronic sequence for rubidium, strontium, and yitrium. A. Zigler, U. Feldman, and G.A. Doschek, J. Opt. Soc. Am. B **3**, 1222 (1986).
41. Double layers in laser produced plasmas. S.Eliezer, H.Hora,A.Ludmirsky,B.Arad ,A. Borovitz,A.Loeb, S.Jackel I.Gazit and A.Zigler . Laser interaction and related plasma phenomena, H. Hora and G. Miley, editors. Vol.7, p. 329 - 346 (1986).
42. The evolution of strong shock waves produced by a trapezoidal laser pulse. S.Eliezer, H.Hora,A.Ludmirsky,B.Arad ,A. Borovitz,A.Loeb, S.Jackel , I.Gazit and A.Zigler**.** Laser interaction and related plasma phenomena, , H. Hora and G.H. Miley, editors Vol.7 p. 276 - 288 , (1986) .
43. Use of unresolved transition arrays for plasma diagnostics. A. Zigler, M. Givon, E. Yarkoni, M. Kishinevsky, B. Arad, and M. Klapisch, Phys. Rev. A **34**, 280 (1987).
44. Use of multilayered targets to inject trace elements into laser produced plasma. A. Zigler, R. W. Lee, and J. D. Kilkenny, Appl. Phys. Lett. **50**, 1133, (1987).
45. Point radiation source characterization. A. Zigler, R. W. Lee, and J. D. Kilkenny. J. Appl. Phys. **62**, 107 (1987).
46. High power laser heating of an elongated dense plasma produced by a capillary discharge. A. Zigler, M. Kishenevsky, M. Givon, and B. Arad, Phys. Rev. A **35**, 4446 (1987).
47. Multiple-Pass amplifiers for High-Power Laser Systems.S.Jackel, A.Ludmirsky, A.Borovitz, B.Arad and A.Zigler. Laser and Particle Beams **5** , 115-124 (1987).
48. Rapid lattice expansion by laser heating. A. Zigler, J. H. Underwood, J. Zhu and R. W. Falcone, Appl. Phys. Lett. **51**, 157 (1987).
49. Electron density dependence of line intensities of Cu-I-like Sm+33 to Yb+41 emitted from tokamak and laser produced plasmas.N.Spector, M. Finkental, E. Moshe B. Arad . S.Jackel and A.Zigler. Phys. Rev. A **38**, 288 (1988).
50. Space and Time-Resolved Diagnostics of Soft X-ray Emission From Laser Plasmas. C.M. Brown, J.House, B.Yakkoby, U. Feldman, J.F. Seely, J.H. Underwood and A. Zigler, Proc. SPIE **913**, 110 (1988).
51. Imaging of laser-produced plasmas at 44 A using a multilayer mirror. C.M. Brown, U. Feldman, J.F. Seely, J.H. Underwood, and A. Zigler, Optics Communications, **68**, 190 (1988).
52. Multiple pulse laser excitation of capillary discharge. R.W. Lee and A. Zigler, Appl. Phys. Lett. **53**, 21 (1988).
53. Gain predictions for nickel-like gadolinium from a 181-level multiconfigurational distorted-wave collisional radiative model. W.H. Goldstein, J. Oreg, A. Zigler, A. Bar Shalom, and M. Klapisch, Phys. Rev. A **38**, 4 (1988).
54. Creation of x-ray laser media by high power laser heating of capillary discharge. A. Zigler, R.W. Lee, and S. Mrovka, Laser and Particles Beams, **7**, 369 (1989).
55. Increase of energy storage in metals without a significant decrease in electrical conductivity. Z. Henis, S. Eliezer, and A. Zigler, J. Phys. D **22**, 995 -1000 (1989).
56. Cold nuclear fusion rates in condensed matter. A phenomenological analysis. Z. Henis, S. Eliezer, and A. Zigler, J. Phys. D **15**, L219 (1989).
57. Super Transition Arrays: A new model for the spectral analysis of hot, dense plasma. A. Bar Shalom, J. Oreg, W.H. Goldstein, D.Shwartz, and A. Zigler, Phys. Rev. A **40** 385 (1989).
58. A Theoretical Study of a Laser Irradiated Capillary Discharge. L.B. Petway, R.W. Lee, and A. Zigler. J. Appl. Phys. **65**, 1276 (1989).
59. Misalignment Sensitivity of Beam Combining By Stimulated Brillouin Scattering. S.Sternklar, D. Chomsky, S. Jackel, and A. Zigler, Opt.Lett. **15**, 384 (1990).
60. Coherent Beam and Image Amplification by Brillouin Enhanced Two Beam Coupling in CS2 , S. Sternklar, D. Chomsky, S. Jackel, and A. Zigler, Opt.Lett. **15**, 616 (1990).
61. High Gain Photorefractive Two Beam Coupling in Semi-insulating GaAs. D. Chomsky, S. Sternklar, and A. Zigler. Appl.Phys. Lett. **57**, 422 (1990).
62. Density Measurement of Dense Capillary Plasma Using X-ray Backlighting .B. Brill, B. Arad, M. Kishenevsky, and A. Zigler, J.Phys. D **23** 1064 (1990).
63. Energy Penetration Depth of Subpicosecond Laser-Plasma Interactions Into Solid Density Matter. A. Zigler, P. Burkhalter, D. Nagel, T. Luk, A. McPherson, and C.K. Rhodes, Appl. Phys. Lett. **59**, 534, (1991).
64. Density-Sensitive Dielectronic Satellite Spectra Emitted During Subpicosecond Laser- Matter Interactions. V.L. Jacobs, A. Zigler, D.A. Newan, P.G. Burkhalter, and D.J. Nagel, , Proc. of Internatinal Workshop On Radiative Properties of Hot Dense Matter, Sarasota, Florida, Edited by R.W Lee ,C.Hooper and J.Seely (World Scientic p. 341- 348, 1991).
65. Elimination of Laser Prepulse By Relativistic Beam Guiding in a Plasma. P. Sprangle, A. Zigler, and E. Esarey, Appl. Phys.Lett. **58**, 854 (1991).
66. X-ray Emission From High Temperature Solid Density Plasma Produced by Intense Subpicosecond Ultraviolet Radiation. A. Zigler, P. Burkhalter, D.J. Nagel, M.D. Rosen, W. Goldstein, T. Luk, A. McPherson and C.K. Rhodes, Proc. of Internatinal Workshop On Radiative Properties of Hot Dense Matter, Sarasota, Florida, Edited by R.W Lee , C.Hooper and J.Seely (World Scientic p. 221- 227, 1991).
67. Plasma Production from Ultraviolet Transmitting Targets Using Subpicosecond Ultraviolet Radiation. A. Zigler, P. Burkhalter, D.J. Nagel, T. Luk, A. McPherson, and C.K. Rhodes, Opt.Lett. **16**, 1261 (1991).
68. Distinct Features of Double Phase Conjugation in Photorefractive Semi-insulating GaAs. D. Homsky, S. Sternklar, and A. Zigler, Opt. Comm, **84**, 104 (1991).
69. Efficient Generation of 9-13A X-Ray From BaF2 Targets. A. Zigler, P. Burkhalter, D.J. Nagel, T. Luk, A. McPherson and C.K. Rhodes. Appl. Phys. Lett. **59**, 777 (1991).
70. Studies of Plasmas Excited by Intense Subpicosecond Radiation for X-ray Generation. A. Zigler, P. Burkhalter, D.J. Nagel, T. Luk, A. McPherson and C. K. Rhodes, SPIE Ultrashort Wavelength. Lasers. vol. **1551**, p.186-199 , (1991).
71. Observation of Density Sensitive Dielectronic Satellite Spectra Produced During Subpicosecond Laser-matter Interaction, A. Zigler, V. Jacobs, P. Burkhalter, D.J. Nagel, T. Luk, A. McPherson, and C. K. Rhodes. Phys. Rev. A **45**, 1849 (1992).
72. Laser Frequency Bandwidth Narrowing by Photorefractive Two Beam Coupling. D. Homsky, S.Sternklar,and A.Zigler, Optics Lett. **18**, 784 (1992).
73. High Repition Rate Laser Systems based on High Reflictivity Brillion Mirrors. S. Jackel, S. Atzmon, S. Sterklar, and A. Zigler, Opt. Eng. **31**, 328 (1992).
74. Localized X-ray Emission From a 650 fs Laser-produced Barium Plasma. W. Goldstein, A. Zigler, P. Burkhalter, D.J. Nagel, T. Luk, A. McPherson, and C.K. Rhodes, Phys. Rev. E **47**, 4349 (1993).
75. Production of a High Density, Long Scale Length Iron Plasma Using a Capillary Discharge. W.J Blynth, J.S. Wark, P.E. Young, and A.Zigler, Laser and Particle Beams **12**, 787 (1994).
76. Analysis of the X-ray Spectra Emitted by Laser Produced Plasma of Highly Ionized Lanthanum and Praseodymium. A.Zigler, P. Mandelbaum, J.L. Schwob, and D. Mitnik, Physica Scripta **50**, 61 (1994).
77. Generation of Large, High Density, Homogeneous Plasma by Capillary Disharge. Y.Ehrich, C. Cohen, and A. Zigler, Appl. Phys. Lett. **64**, 3542 (1994).
78. Increase of Multilayer X-ray Reflectivity Induced by Pulsed Laser Heating. A.Zigler, M.Fraenkel, Z.Henis, and S. Eliezer, J.Appl. Phys. **75**, 8085 (1994) .
79. Pump Polarization Dependence of Stimulated Brillouin Scattering with a Multimode Laser. Y.Glick, S. Sternklar, S. Jackel, and A. Zigler, Nonlinear Optics **11**, 53 (1995).
80. Magnetcally Insulated Photoconducting Semiconductor Switches. K. Papodopoulos, A. Zigler, and R.Shanny, Comm. on Plasma Physics **16**, 221 (1995).
81. Dark Current Reduction in High Power Photoconductng Semiconductor Switches. D. Hashimshony, C. Cohen, and A. Zigler, Opt. Com. **124**, 443 (1996).
82. Optical Guiding of High Intensity Laser Pulses in Long Plasma Channel Formed by a Slow Capillary Discharge. A. Zigler, Y.Ehrich, C. Cohen, J. Krall, and P. Sprangle. J. Opt. Soc.Amer. B **13**, 67 (1996).
83. On The Coolng Of The Plasma Fire Ball, Produced by a Laser Spark In Front of Liquids and Solids. B. Meerson, D. Kaganovich, C. Cohen, and A. Zigler, Phys. of Plasmas **3**, 631 (1996).
84. Response of a Magnetized Semiconductor Plasma to an Ionizing Laser Pulse. K.Papadopoulos, D. Hashimshony, C. Cohen, and A. Zigler, IEEE Tran. on Plasma Science **24**, 1095 (1996).
85. Collisionless Breakdown of Magnetic Insulation in Plasmas. K. Papadopoulos, D.L Book and A. Zigler, Phys. Rev. Lett. **76**, 3120 (1996).
86. High Gain Ni-like Laser Driven by Two Laser Pulses. A.Baer, J.L. Schwob, A.Zigler, S.Eliezer, and Z. Henis, J. Quant. Electr. **23**, 5, (1996).
87. Optimal X-ray Source Development in the Spectral Range 4 -14 A Using a Nd-YAG High Power Laser. M. Fraenkel, A. Zigler, Y. Horovitz, Z. Henis, S. Eliezer, J. Appl. Phys. **80**, 5598 (1996).
88. Optical Guiding of High Intensity Laser Pulse in a Plasma Density Channel. Y. Ehrich, A.Zigler, C.Cohen, J. Krall and P. Sprangle, Phys. Rev.Lett. **77**, 4186 (1996).
89. Spectrally Resolved Image of 120 fsec Laser -Produced Plasma. A.Y Faenov, T.A .Pikuz, M. Fraenkel, and A. Zigler, Physica Scripta **55**, 167 (1997).
90. Generation of intense collimated monochromatic X-ray beam using femtosecond table top laser, M. Fraenkel, A. Zigler, A.Y Faenov, T.A . Pikuz Physica Scripta **56**, 571, (1997).
91. Investigations of double capillary discharge scheme for production of wave guide in plasma D.Kaganovich, P. Sasorov, Y. Ehrlich and A.Zigler Appl.Phys.Lett.**71**, 3464, (1997).
92. Inner-shell Satellite Transitions in Dense Short Pulse Plasmas. F.B. Rosmej, A. Ya. Faenov, T.A. Pikuz, A. Scafati, M. Fraenkel and A. Zigler,. J.Q.R.S.T **58**, 859 (1997).
93. X-ray Spectrum Emitted by Laser-Produced Barium Plasma. R. Doron, M. Fraenkel, P. Mandelbaum, J.L. Schwob and A. Zigler, Physica Scripta **58**, 19 (1998).
94. High Resolution X-ray Spectrum of Laser-Produced Barium Plasma in the 9.1-9.36Å Wavelength Range. R. Doron, E. Behar, M. Fraenkel, P. Mandelbaum, A. Zigler and J.L. Schwob.Phys. Rev. A 58, 1859, (1998).
95. The Inverse Faraday Effect in Plasmas Produced by Circularly Polarized Laser Light in the Range of Intensities 109 - 1014 W/cm2 . Y. Horovitz, S.Eliezer, Z.Henis, A. Ludmirsky, B.Arad and A.Zigler, Phys. Lett A, 246, 329 (1998).
96. Guiding and Damping of High Intensity Laser Pulses in Long Plasma Channels. Y.Ehrlich, C. Cohen, D. Kaganovich, R. F. Hubbard, P. Sprangle and A. Zigler, J.Opt.Soc.Amer. B,15, 2417 (1998).
97. [In situ elemental analysis using a laser spectroscopy instrument](http://wos.isiglobalnet.com/CIW.cgi?PCr7EKfY@QAAAAYPPao_6DCD0227_PCr7EKfY@QAAAAYPPao-0&Func=Abstract&doc=1/17) Galambos JP, Zigler **A** AM LAB 31 (21): 30-31 OCT 1999
98. Feasibility study of collimated x-ray beam formation from femtosecond laser produced plasma using spherically bent crystals. M.Sancez del Rio, M.Fraenkel , T.Pikuz, A.Faenov and A.Zigler . Rev.Sci.Instrum. 70, 1615, 1999.
99. Large-field of view high-resolution x-ray monochromatic microscope. M.Fraenkel , A.Zigler, A.Faenov and T.Pikuz Physica Scripta 59, 246 1999
100. Third harmonics generation at atmospheric pressure in methane using intense femtosecond laser pulses. G.Marcus, Z.Henis and A. Zigler Accepted for publication in J.Opt. Soc. Amer. B 1999
101. Radiation from autoionising levels correlated with single excited states of highly charged ions in dense cold plasmas. F.Rosmej, A.Faenov , T.Pikuz, M.Fraenkel and A.Zigler , Physica Scripta T80, 547, 1999
102. Spectra of heavy atom plasmas created by a short pulse lasers. M. Fraenkel, A. Zigler, A. Bar-Shalom and J. Oreg. Phys.Scripta 60, 222, (1999)
103. Generation of sub-millimeter radiation from a static field by a superluminous ionization front in semiconductor plasma. D.Hashimshony, A.Zigler and D.Papadopulous. Appl.Phys.Lett.75, 892, 1999.
104. Variable Profile Capillary Discharge for the Improved Phase Matching in a Laser Wakefield Accelerator. D. Kaganovitch, P.Sasorov and A.Zigler Appl.Phys.Lett. **75**, 772 (1999).
105. D.Kaganovitch, A.Ting ,C Moore,Y, Ehrlich, P.Sprangle and A.Zigler Phys.Rev.E 59, R4769,1999.
106. Simulation and design of channel-guided laser wakefield accelerators. R.Habbard, D.Kaganovitch, A.Ting ,C Moore,Y, Ehrlich, P.Sprangle and A.Zigler Phys.Rev.E 1999.
107. A. Goltsov, A. Morosov, S. Suckewer, R. Elton, U. Feldman, K. Krushelnick, T. Jones, C. Moore, J. Seely, P. Sprangle, A. Ting, and A. Zigler, *IEEE Journal of Selected Topics in Quantum Electronics*, 65, 2453, 1999.
108. “Simulation of Density Channel Guiding in Capillary Discharge Experiments and Laser Wakefield Accelerators,” R. F. Hubbard, C. Moore, P. Sprangle, A. Ting, D. Kaganovich, A. Zigler, and B. Hafizi, *Proceedings of the 1999 Particle Accelerator Conference.*
109. D. Hashimshony , A. Zigler and K. Papadopoulos,"Generation of tunable far-infrared radiation by the interaction of a superluminous ionizing front with an
110. D. Hashimshony , A. Zigler and K. Papadopoulos,"Generation of tunable, bandwidth controllable terahertz radiation”, THz and GHz Photonics. Edt. R.J Hwu and K. Wu Proc. SPIE, 3795, 477, 1999.
111. D. Hashimshony , C. Cohen and A. Zigler*,"Demonstration of submillimeter wave radiation generation from static field by a superluminous ionization front in semiconductor capacitor array"* Ultra-Wideband, Short Pulse Electrom. **4**, Proc. Eurem, Ed. Shiloh and Mandlburg, 4, 27, 1998.
112. Measurement of the energy penetration depth into solid targets irradiated by ultra short laser pulses. M Fraenkel , A. Zigler, Z.Henis and N.E Andreev. Phys. Rev. E 61, 1899, 2000.
113. Investigation of a laser produced cerium plasma by the analysis of high resolution x-ray spectrum. R.Doron, M.Fraenkel, P Mandelbaum , Y. Faenov, T. Pikuz and A.Zigler Phys.Rev A, 62, 508, 2000
114. D. Hashimshony , A. Zigler and K. Papadopoulos "Miniature Photoconducting Capacitor Array as a source for Tunable THz radiation", Rev. of Scientific Instruments,**71**, 2380, 2000.
115. Interaction of High Intensity Short Pulse Laser with Plasma. A.Zigler , D.Kaganovich , D.Hashimshony and C.Cohen. Nonlinear Optics 24, 271, 2000
116. Laser Propagation and Wakefield Generation in Tapered Plasma Channels. P. Sprangle R. F. Hubbard, D. Kaganovich, B. Hafizi,C. Moore, A. Ting and A. Zigler. Phys.Rev. E 63, 5788, 2000
117. Simulation of Density Channel Guiding in Capillary Discharge Experiments and Laser Wakefield Accelerators. R. F. Hubbard, , D. Kaganovich, , B. Hafizi,C. Moore, P. Sprangle, A. Ting and A. Zigler Phys.Rev. E 63, 6502, 2001
118. X-ray spectrum emitted by a laser produced cerium plasma in the 7.5 to 12A wavelength range. R.Doron, M.Fraenkel, P Mandelbaum , Y. Faenov, T. Pikuz and A.Zigler. Physica Scripta 63,22, 2001
119. Shadow monochromatic backlighting. A.Faenov , T.Pikuz, M.Fraenkel and A.Zigler Laser Part. Beams, 19, 285, 2001
120. Stable Laser Pulse propagation in Plasma Channels for GeV Electron Acceleration. P. Sprangle R. F. Hubbard, D. Kaganovich, B. Hafizi, C. Moore, A. Ting and A. Zigler Phys.Rev.Lett. 85, 5110, 2001
121. Conversion of Electrostatic to Electromagnetic Waves by Super-luminous Ionization Fronts. .Hashimshony, A.Zigler and Papadopoulos. Phys.Rev.Lett. 86, 2806, 2001
122. Detection and Electrical Characterization of Hidden Layers Using Time-Domain Analysis of Terahertz Reflections I.Geltner, D. Hashimshony and A. Zigler Appl.Phys.Lett. 73, 1357, 2001
123. Wakefield generation and GeV acceleration in tapered plasma channels, P.Sprangle, B. Hafizi, A.Ting , R. Hubbard, D. Kaganovich and A.Zigler. Phys.Rev. E 63 6405, 2001
124. Velocity Control and Staging in Laser Wakefield Accelerators Using Segmented Capillary Discharges D. Kaganovich, A. Zigler, R.F. Hubbard, Sprangle and A.Ting Appl.Phys.Lett. 72, 759, 2001
125. R. F. Hubbard, B. Hafizi, A. Ting, D. Kaganovich, P. Sprangle, and A. Zigler, “High intensity focusing of laser pulses using a short plasma channel lens,” Phys. Plasmas.
126. D.Hashimshony, I.Geltner, G.Cohen, Y.Avitzur A.Zigler and C.Smith, *"*Characterization of the electrical properties and thickness of thin epitaxial semiconductor layers by THz reflection spectroscopy*”* J.Appl.Phys, **90**, 5778, 2001.
127. Lasing to ground state of ions in discharge created plasma in microcapillary
Goltsov A, Morozov A, Ping Y, Geltner I, Suckewer, Zigler A
JOURNAL DE PHYSIQUE IV 11 165-173 JUL 2001
128. [Development of a method for automated quantitative analysis of ores using LIBS](http://wos.isiglobalnet.com/CIW.cgi?PCr7EKfY@QAAAAYPPao_6DCD0227_PCr7EKfY@QAAAAYPPao-0&Func=Abstract&doc=1/4)
Rosenwasser S, Asimellis G, Bromley B and Zigler A SPECTROCHIM ACTA B 56 (6): 707-714 JUN 29 2001
129. [Shadow monochromatic backlighting: Large-field high resolution X-ray shadowgraphy with improved spectral tunability](http://wos.isiglobalnet.com/CIW.cgi?PEQkpafY@QAAAG7hhMo_181E5181_PEQkpafY@QAAAG7hhMo-0&Func=Abstract&doc=4/1) Pikuz TA, Faenov AY, Zigler A, et al. LASER PART BEAMS 19 (2): 285-293 JUN 2001
130. GeV acceleration in tapered plasma channels. P.Sprangle, B. Hafizi, A.Ting , R. Hubbard, D. Gordon and A.Zigler Phys. of Plasma 9, 2364 , 2002
131. R. F. Hubbard, B. Hafizi, A. Ting, D. Kaganovich, P. Sprangle, and A. Zigler, “High intensity focusing of laser pulses using a short plasma channel lens,” Phys. Plasmas.9, 1431, 2002
132. [Detection and electrical characterization of hidden layers using time-domain analysis of terahertz reflections](http://wos10.isiknowledge.com/CIW.cgi?PobvgT-0_077413D6_PobvgT-wadIAAAPWMr8-0&Func=Abstract&doc=1/4) Geltner I, Hashimshony D, **Zigler A** J APPL PHYS 92 (1): 203-206 JUL 1 2002
133. [Tunable, bandwidth controllable source of THz radiation](http://wos10.isiknowledge.com/CIW.cgi?PobvgT-0_077413D6_PobvgT-wadIAAAPWMr8-0&Func=Abstract&doc=1/3)
**Zigler A**, Hashimshony D, Papadopoulos K IEE P-OPTOELECTRON 149 (3): 93-97 JUN 2002
134. [High-current capillary discharge with prepulse ablative plasma](http://wos10.isiknowledge.com/CIW.cgi?PobvgT-0_077413D6_PobvgT-wadIAAAPWMr8-0&Func=Abstract&doc=1/2)
Levin M, Marcus G, Zigler A. . J APPL PHYS 93 (2): 851-854 JAN 15 2003
135. [Generation of ultrawide-band chirped sources in the infrared through parametric interactions in periodically poled crystals](http://wos10.isiknowledge.com/CIW.cgi?PobvgT-0_077413D6_PobvgT-wadIAAAPWMr8-0&Func=Abstract&doc=1/1) Marcus G, **Zigler A** APPL PHYS LETT 82 (2): 164-166 JAN 13 2003
136. Greenberg B, Levin M, Pukhov A, Zigler A [Low jitter capillary discharge channels](http://wos4.newisiknowledge.com/CIW.cgi?SID=P56Zlgrg-GkAAD8OcCo&Func=Abstract&doc=1/1)
APPL PHYS LETT 83 (14): 2961-2963 OCT 6 2003
137. Duncan M, Grossman J, **Zigler A**, et al. [Hyperspectral imaging (HSI): A new approach to identifying mucosal irregularities](http://wos4.newisiknowledge.com/CIW.cgi?SID=P56Zlgrg-GkAAD8OcCo&Func=Abstract&doc=1/2) GASTROINTEST ENDOSC 57 (5): AB178-AB178 Suppl. 1 APR 2003
138. Yakimenko V, Pogorelsky IV, Pavlishin IV, et al. [Cohesive acceleration and focusing of relativistic electrons in overdense plasma](http://wos4.newisiknowledge.com/CIW.cgi?SID=P56Zlgrg-GkAAD8OcCo&Func=Abstract&doc=1/3) PHYS REV LETT 91 (1): Art. No. 014802 JUL 4 2003
139. Hafizi B, Gordon DF, **Zigler A**, et al. [Electron trajectories in the magnetic field of capillary discharge: Application to laser wakefield accelerators in plasma channel](http://wos4.newisiknowledge.com/CIW.cgi?SID=P56Zlgrg-GkAAD8OcCo&Func=Abstract&doc=1/4)
PHYS PLASMAS 10 (6): 2545-2551 JUN 2003
140. Pogorelsky IV, Pavlishin IV, Ben-Zvi I, et al.[Transmission of high-power CO2 laser pulses through a plasma channel](http://wos4.isiknowledge.com/CIW.cgi?SID=QDzFEQrg-GkAAHJOlwg&Func=Abstract&doc=1/1) APPL PHYS LETT 83 (17): 3459-3461 OCT 27 2003
141. Marcus G, Friedland L, Zigler A
[From quantum ladder climbing to classical autoresonance](http://wos4.isiknowledge.com/?SID=QX6CvArg-GkAABDydp8&Func=Abstract&doc=1/2)
PHYSICAL REVIEW A 69 (1): Art. No. 013407 JAN 2004
142. Fibich G, Eisenmann S, Ilan and A.Zigler
[Control of multiple filamentation in air](http://wos15.isiknowledge.com/?SID=ObB2h@4knNca47e1Cnc&Func=Abstract&doc=1/6)
OPTICS LETTERS 29 (15): 1772-1774 AUG 1 2004
143. Pikuz T, Faenov A, Skobelev I, et al.
[Easy spectrally tunable highly efficient X-ray backlighting schemes based on spherically bent crystals](http://wos15.isiknowledge.com/?SID=ObB2h@4knNca47e1Cnc&Func=Abstract&doc=1/5)  LASER AND PARTICLE BEAMS 22 (3): 289-300 SEP 2004
144. Kimura WD, Andreev NE, Babzien M, et al.
[Pseudoresonant laser wakefield acceleration driven by 10.6-mu m laser light](http://wos15.isiknowledge.com/?SID=ObB2h@4knNca47e1Cnc&Func=Abstract&doc=1/4)
IEEE TRANSACTIONS ON PLASMA SCIENCE 33 (1): 3-7 Part 1 FEB 2005
145. Marcus G, **Zigler A**, Eger D, et al.
[Generation of a high-energy ultrawideband chirped source in periodically poled LiTaO3](http://wos15.isiknowledge.com/?SID=ObB2h@4knNca47e1Cnc&Func=Abstract&doc=1/3)
JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS 22 (3): 620-622 MAR 2005
146. Kaganovich D, Ting AC, Gordon DF, et al.
[Generation of high-energy electrons in a double gas jet and laser wakefield acceleration](http://wos15.isiknowledge.com/?SID=ObB2h@4knNca47e1Cnc&Func=Abstract&doc=1/2)
IEEE TRANSACTIONS ON PLASMA SCIENCE 33 (2): 735-738 Part 2 APR 2005
147. Hubbard RR, Gordon DF, Cooley JH, et al. [Trapping and acceleration of nonideal injected electron runches in laser Wakefield accelerators](http://wos15.isiknowledge.com/?SID=ObB2h@4knNca47e1Cnc&Func=Abstract&doc=1/1)  IEEE TRANSACTIONS ON PLASMA SCIENCE 33 (2): 712-722 Part 2 APR 2005
148. Janulewicz KA, Schnurer M, M.Levin and A. Zigler [Enhancement of a 24.77-nm line emitted by the plasma of a boron nitride capillary discharge irradiated by a high-intensity ultrashort laser pulse](http://wos15.isiknowledge.com/?SID=iN3nMgAofHgG8HPn9fH&Func=Abstract&doc=3/1)  OPTICS LETTERS 30 (12): 1572-1574 JUN 15 2005
149. Louzon E, Henis Z, Pecker S, and A.Zigler. [Reduction of damage threshold in dielectric materials induced by negatively chirped laser pulses](http://wos02.isiknowledge.com/?SID=Z1biMeeahji@B@eafh@&Func=Abstract&doc=1/1)  APPLIED PHYSICS LETTERS 87 (24): Art. No. 241903 DEC 12 2005
150. Kaganovich D, Ting A, Gordon DF, et al. [First demonstration of a staged all-optical laser wakefield acceleration](http://wos02.isiknowledge.com/?SID=Z1biMeeahji@B@eafh@&Func=Abstract&doc=1/2)  PHYSICS OF PLASMAS 12 (10): Art. No. 100702 OCT 2005
151. Penano JR, Sprangle P, Hafizi B, A.Zigler [Transmission of intense femtosecond laser pulses into dielectrics](http://wos02.isiknowledge.com/?SID=Z1biMeeahji@B@eafh@&Func=Abstract&doc=1/3)  PHYSICAL REVIEW E 72 (3): Art. No. 036412 Part 2 SEP 2005
152. Marcus G, Friedland L, Zigler **A** [Autoresonant excitation and control of molecular degrees of freedom in three dimensions](http://wos02.isiknowledge.com/?SID=Z1biMeeahji@B@eafh@&Func=Abstract&doc=1/4)  PHYSICAL REVIEW A 72 (3): Art. No. 033404 SEP 2005
153. Fibich G, Eisenmann S, Ilan B, et al. [Self-focusing distance of very high power laser pulses](http://wos02.isiknowledge.com/?SID=Z1biMeeahji@B@eafh@&Func=Abstract&doc=1/5)  OPTICS EXPRESS 13 (15): 5897-5903 JUL 25 2005
154. Levin M, Pukhov A, Hubbard RF, et al. [Longitudinal profiles of plasma parameters in a laser-ignited capillary discharge and implications for laser wakefield accelerator applications](http://wos.isiknowledge.com/?SID=D2@51hBH1d9l@jHMaLb&Func=Abstract&doc=1/1)  APPLIED PHYSICS LETTERS 87 (26): Art. No. 261501 DEC 26 2005
155. Marcus G, **Zigler A**, Friedland L [Molecular vibrational ladder climbing using a sub-nanosecond chirped laser pulse](http://wos.isiknowledge.com/?SID=V2CGhibhepE6EAJpNb8&Func=Abstract&doc=1/2)  EUROPHYSICS LETTERS 74 (1): 43-48 APR 2006
156. Kimura WD, Andreev NE, Babzien M, et al. [Inverse free electron lasers and laser wakefield acceleration driven by CO2 lasers](http://wos.isiknowledge.com/?SID=V2CGhibhepE6EAJpNb8&Func=Abstract&doc=1/3)  PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY A-MATHEMATICAL PHYSICAL AND ENGINEERING SCIENCES 364 (1840): 611-622 MAR 15 2006
157. Palchan T, Eisenmann S, **Zigler A**, et al.
[All optical electron injector using an intense ultrashort pulse laser and a solid wire target](http://wos.isiknowledge.com/?SID=V29G8Dc8dg@GJEkKm9@&Func=Abstract&doc=1/1)  APPLIED PHYSICS B-LASERS AND OPTICS 83 (2): 219-223 MAY 2006
158. Pogorelsky IV, Babzien M, Kusche KP, et al. [Plasma-based advanced accelerators at the Brookhaven Accelerator Test Facility](http://apps.isiknowledge.com/WoS/CIW.cgi?SID=P2PjJ3lCd2lHchiPl1k&Func=Abstract&doc=2/5)  LASER PHYSICS 16 (2): 259-266 FEB 2006
159. Long plasma channels in segmented capillary discharges M. Levin, A. Pukhov, and A. Zigler, R. F. Hubbard, A. Ting, D. F. Gordon, and P. Sprangle , D. Kaganovich, PHYSICS OF PLASMAS **13**, 083108 \_2006\_
160. Palchan T, Pecker S, Henis Z, et al.
[Efficient coupling of high intensity short laser pulses into snow clusters](http://apps.isiknowledge.com/WoS/CIW.cgi?SID=P2PjJ3lCd2lHchiPl1k&Func=Abstract&doc=2/4)
APPLIED PHYSICS LETTERS 90 (4): Art. No. 041501 2007
161. Eisenmann S, Louzon E, Katzir Y, et al.
[Control of the filamentation distance and pattern in long-range atmospheric propagation](http://apps.isiknowledge.com/WoS/CIW.cgi?SID=P2PjJ3lCd2lHchiPl1k&Func=Abstract&doc=2/2)  OPTICS EXPRESS 15 (6): 2779-2784 , 2007
162. Eisenmann S, Pukhov A, **Zigler A** [Fine structure of a laser-plasma filament in air](http://apps.isiknowledge.com/WoS/CIW.cgi?SID=P2PjJ3lCd2lHchiPl1k&Func=Abstract&doc=2/1)
PHYSICAL REVIEW LETTERS 98 (15): Art. No. 155002 , 2007
163. Interaction of intense short laser pulses with air and dielectric materials
Eisenmann, S; Katzir, Y; Zigler, A, et al. INTERNATIONAL JOURNAL OF MODERN PHYSICS B   Volume: 21   Pages: 615-625 , 2007
164. Guiding of high laser intensities in long plasma channels Levin, M; Eisenmann, S; Palchan, T, et al. INTERNATIONAL JOURNAL OF MODERN PHYSICS B   Volume: 21   Pages: 361-371, 2007
165. Generation of fast ions by an efficient coupling of high power laser into snow nanotubes Palchan, T; Henis, Z; Faenov, AY, et al. APPLIED PHYSICS LETTERS   Volume: 91   Article Number: 251501   , 2007
166. [Application of Snow Nanograin Targets for the Generation of Fast Ions in Femtosecond Laser Plasma](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=X2KjjCKpgH384L81E3F&page=1&doc=1&colname=WOS) Faenov, AY; Magunov, AI; Pikuz, SA, and A.Zigler
JOURNAL OF EXPERIMENTAL AND THEORETICAL PHYSICS    107    351-355  2008
167. [Generation of controlled radiation sources in the atmosphere using a dual femtosecond/nanosecond laser pulse](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=X2KjjCKpgH384L81E3F&page=1&doc=2&colname=WOS) Henis, Z; Milikh, G; Papadopoulos, K and A.Zigler JOURNAL OF APPLIED PHYSICS    103,    103111,  2008
168. [Effect of an energy reservoir on the atmospheric propagation of laser-plasma filaments](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=X2KjjCKpgH384L81E3F&page=1&doc=3&colname=WOS)
Eisenmann, S; Penano, J; Sprangle, P, and A.Zigler
PHYSICAL REVIEW LETTERS    100,    155003 ,   2008
169. [Application of Snow Nanograin Targets for the Generation of Fast Ions in Femtosecond Laser Plasma](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=X2KjjCKpgH384L81E3F&page=1&doc=1&colname=WOS) Faenov, AY; Magunov, AI; Pikuz, SA, and A.Zigler JOURNAL OF EXPERIMENTAL AND THEORETICAL PHYSICS    107    351-355  2008
170. [A plasma microlens for ultrashort high power lasers](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=N1MjGMJILADK48HeBoM&page=1&doc=3&colname=WOS) Katzir, Y; Eisenmann, S; Ferber, Y,A.Zigler et al. APPLIED PHYSICS LETt. 95 031101 2009
171. [Micro-radiography with laser plasma X-ray source operating in air atmosphere](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=R2g5nIJ4aOk@5MobaNf&page=1&doc=4&colname=WOS) Pikuz, SA; Chefonov, OV; Gasilov, SV, et al. LASER AND PARTICLE BEAMS   28,: 393-397   : 2010
172. [Plasma structures for quasiphase matched high harmonic generation](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=R2g5nIJ4aOk@5MobaNf&page=1&doc=1&colname=WOS) Sheinfux, AH; Henis, Z; Levin, M, and A.Zigler APPLIED PHYSICS LETTERS    98, 14, 1110 2011
173. [5.5-7.5 MeV Proton Generation by a Moderate-Intensity Ultrashort-Pulse Laser Interaction with H2O Nanowire Targets](http://apps.isiknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=R2g5nIJ4aOk@5MobaNf&page=1&doc=2&colname=WOS) Zigler, A; Palchan, T; Bruner, N, et al. PHYSICAL REVIEW LETTERS    106,: 134801   , 2011
174. [Third harmonic generation by a low intensity laser pulse in a corrugated discharge capillary](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=Refine&qid=2&SID=U19hpoMI1F17Abgbal7&page=1&doc=1)  Katzir Y.; Ferber Y.; Megidish E.; et al.: APPLIED PHYSICS LETTERS   99 : 211501  2011
175. [Quasi-phase matching of third harmonic generation in corrugated discharge capillary](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=Refine&qid=2&SID=U19hpoMI1F17Abgbal7&page=1&doc=2)  Katzir Y.; Ferber Y.; Megidish E.; et al. NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-   653    150-152    2011
176. [Generation of fast protons by interaction of modest laser intensities with H(2)O "snow" nano-wire targets](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=Refine&qid=2&SID=U19hpoMI1F17Abgbal7&page=1&doc=3)  Bruner Nir; Schleifer Elad; Palchan Tala; et al. NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A 653    156-158 2011
177. [Microwave diagnostics of femtosecond laser-generated plasma filaments](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=Refine&qid=2&SID=U19hpoMI1F17Abgbal7&page=1&doc=4)
Papeer J.; Mitchell C.; Penano J.; et al. APPL. PHYS. LETt.  99    141503   2011
178. [Generation of hard x rays by femtosecond laser pulse interaction with solid targets in atmosphere](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=V1gN8eDccBPFaC@LIEL&page=1&doc=2)  Zhidkov Alexey G.; Pikuz .S; Faenov Ya; et all OPTICS LETT. 37   884-886    1 2012
179. [Diagnostics of dielectronic processes in laser produced samarium plasma](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=V1gN8eDccBPFaC@LIEL&page=1&doc=3) Louzon E.; Frank Y.; Raicher E.; et al. HIGH ENERGY DENSITY PHYSICS   8   81, 2012
180. [Measuring the stability of polarization orientation in high intensity laser filaments in air](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=Z13n3AHIIaHHj8BllHM&page=1&doc=5) Sheinfux, A. H.; Schleifer, E.; Papeer, J Zigler A.. APPL. PHYS. LET. 101  201105  2012
181. [Boron Nitride plasma micro lens for high intensity laser pre-pulse suppression](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=Z13n3AHIIaHHj8BllHM&page=1&doc=2)  Katzir, Y.; Ferber, Y.; Penano, R.; Sprangle P. Zigler A. OPTICS EXP. 21 507 2013
182. [Enhanced proton acceleration by an ultrashort laser interaction with structured dynamic plasma targets.](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=Z13n3AHIIaHHj8BllHM&page=1&doc=1)  Zigler, A; Eisenman, S; Botton, M; et al. Phys. Rev. Lett.110 215004    2013
183. [Plasma jets produced by low energy laser pulse interaction with planar and cratered targets](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=2&SID=W2phTHiWYWwbyOhI1t2&page=1&doc=4)  Louzon, E.; Raicher, E.; Frank, Y.; et al. HIGH ENERGY DENSITY PHYSICS   9    505-509    2013
184. [Temporal evolution of femtosecond laser induced plasma filament in air and N-2](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=2&SID=W2phTHiWYWwbyOhI1t2&page=1&doc=3)  Papeer, J.; Gordon, D.; Sprangle, P.; et al. APPLIED PHYS. LETTERS  103 24    2013
185. The Lagrangian formulation of strong-field quantum electrodynamics in a plasma Raicher, Erez; Eliezer, Shalom; Zigler, Arie PHYSICS OF PLASMAS   21 053103    MAY 2014
186. [Active remote detection of radioactivity based on electromagnetic signatures](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=4&SID=W2phTHiWYWwbyOhI1t2&page=1&doc=2) Sprangle, P.; Hafizi, B.; Milchberg, H.; et al. PHYSICS OF PLASMAS  Volume: 21    Article Number: 013103    JAN 2014
187. Scleral cross-linking using riboflavin and ultraviolet-A radiation for prevention of progressive myopia in a rabbit model Dotan, Assaf; Kremer, Israel; Livnat, Tami; et al. EXPERIMENTAL EYE RESEARCH  Volume: 127   Pages: 190-195    OCT 2014
188. [Extended lifetime of high density plasma filament generated by a dual femtosecond-nanosecond laser pulse in air](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=Z2bXaDP9rUPZp9f8aXp&page=1&doc=3)  Papeer, J.; Botton, M.; Gordon, D.; et al. NEW JOURNAL OF PHYSICS  Volume: 16      123046  2014
189. [Control of snow morphology for laser-based accelerator targets](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=Z2bXaDP9rUPZp9f8aXp&page=1&doc=2)  Schleifer, E.; Nahum, E.; Botton, M.; et al. JOURNAL OF PHYSICS D-APPLIED PHYSICS   48 8 085502   MAR 4 2015
190. [Multi variable control of filamentation of femtosecond laser pulses propagating in air](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=Z2bXaDP9rUPZp9f8aXp&page=1&doc=1)  Papeer, J.; Botton, M.; Gordon, D.; et al. JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS  : 48    9   Special 094005    MAY 14 2015
191. [Generation of concatenated long high-density plasma channels in air by a single femtosecond laser pulse](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=P1pzYSXpJCQsxHE7OFp&page=1&doc=1)  Papeer, J.; Bruch, R.; Dekel, E.; et al. APPLIED PHYSICS LETTERS   107    124102    2015
192. [Extended lifetime of high density plasma filament generated by a dual femto-nanosecond laser pulse (vol 16, 123046, 2014)](http://apps.webofknowledge.com/full_record.do?product=UA&search_mode=GeneralSearch&qid=1&SID=P1pzYSXpJCQsxHE7OFp&page=1&doc=2)  Papeer, J.; Botton, M.; Gordon, D.; et al. NEW JOURNAL OF PHYSICS : 17 089501    2015



Prof. A.Zigler

24 December 2015

Yosi Ehrlich

Birth: 11/19/65, Jerusalem, Israel.
Marital Status: Married + 3, live in Talmon.
Phone: 972-8-9434706, cell: 972-50-6292348
Email: yosi@soreq.gov.il

**Education**

1989-1991 – B.Sc.: Physics & Mathematics, Hebrew University.
1991-1993 – M.Sc.: Physics, under the supervision of Professor Arie Zigler, Hebrew University. M.Sc. thesis: Electrical capillary discharge as a source of large, high density, homogeneous plasma.
1993-1998 – Ph.D.: Physics, under the supervision of Professor Arie Zigler, Hebrew University. Ph.D. thesis: Propagation of short intense laser pulses in plasmas.

Areas of Expertise: Strongly coupled plasma, frequency conversion, atmospheric optics, remote sensing, high energy density plasmas, laser - plasma interaction, X-ray diagnostics.

**Professional Experience**

1998-2005: Researcher at Nonlinear Optics group / Atmospheric Optics group, Soreq NRC, Israel.
Wavelength conversion, mainly OPO wavelength conversion towards the near, medium and far IR. OPO wavelength tuning control and spatial beam quality improvement.
Holographic photography at a micron scale resolution. Development and establishment of a research laboratory for optical remote sensing, using wavelength tunable laser devices.
Joint research with the Hebrew University and Tel Aviv University on optical self-guiding of ultra-short laser pulses in air.

2005-2010: Researcher at atmospheric optics group and plasma group, Soreq NRC, Israel.
Wavelength conversion. OPO at high rep-rate, pulse energy and beam quality. Innovative use of seeding of a confocal OPO for beam quality improvement. Remote sensing of gases and aerosols at different scenarios. High intensity laser-matter interaction. High power lasers frequency conversion, and beam diagnostics. Soft x-ray spectroscopy and imaging.
Advanced research on optical self-guiding of powerful laser pulses in air,

In collaboration with the Hebrew University and Tel Aviv University.

2010-2011: Sabbatical year at the Hebrew University, Israel.

Soft X-ray spectroscopy. Control of the filamentation process of femtosecond laser pulses in air. Microwave diagnostics of femtosecond laser-generated plasma filaments. Controlling and characterizing of polarization in self-guided laser pulses.

2011-2016: Researcher at plasma group, Soreq NRC, Israel.

Development of a variety of soft x-ray diagnostics, transmission gratings spectroscopy, x-ray imaging, x-ray component calibration. Advanced laser- plasma experiments.

**Awards**

Rector's Award for academic excellence, Hebrew university,1989.
Rector's Award for M.Sc. students, Hebrew university, 1992.
Shimon Offer Award, Hebrew university, 1992.
Excellence Scholarship, Hebrew university, 1992.

Excellence Scholarship, Hebrew university, 1993.
Summer Excellence Scholarship , Hebrew university, 1995.
Israel Physical Society Award for outstanding Ph.D. student's research 1997.
Katsir Scholarship, Soreq NRC 1998-2004.
Efficiency award, Soreq NRC, 1999.
Efficiency award, Soreq NRC, 2000.
Efficiency award, Soreq NRC, 2001.
Outstanding employee of Electro-Optics Division Soreq NRC, 2008.

Outstanding research, Research Day, Soreq NRC, 2011.

Outstanding research, Research Day, Soreq NRC, 2012.

Publication list

**Refereed journal papers:**

1. Y. Ehrlich, C. Cohen, and A.Zigler, J.S. Wark*, Generation of large, high density, homogeneous plasma by capillary discharge*. Appl. Pyhs. Lett. **64** 3542 (1994).
2. A. Zigler, Y. Ehrlich, and C. Cohen, J. Krall and P. Sprangle, *Optical guiding of high-intensity laser pulses in a long plasma channel formed by a slow capilla discharge.* J. Opt. Soc. Am. B **13** 68 (1996).
3. Y. Ehrlich, C. Cohen, and A. Zigler, J. Krall, P. Sprangle, and E. Esarey, *Guiding of High Intensity Laser Pulses in Straight and Curved Plasma Channel Experiments,* Phys. Rev. Lett. **77** 4186 (1996).
4. D. Kaganovich, P.V. Sasorov, Y. Ehrlich, C. Cohen, and A.Zigler, *Investigation of Double Capillary  Discharge Scheme for Production of Wave Guide in Plasma,*  Appl. Phys. Lett. **71** 2925  (1997).
5. Y. Ehrlich, D. Kaganovich, C. Cohen, and A.Zigler, R.F. Hubbard, P. Sprangle, and E. Esarey, *Long Channel Optical Guiding of High Intensity Laser Pulses*, JOSA B **15**, 2416 (1998).
6. D. Kaganovich, a. Ting, C.I. Moore, A. Zigler, H.R. Burris, Y. Ehrlich, R. Hubbard and P. Sprangle, *High Efficiency Guiding of Terawatt Subpicosecond Laser Pulses in a Capillary Discharge Plasma Channel*, Phys. Rev. E **59**, R4769, (1999).
7. I. Paiss, E. Lebiush, Y. Tzuk, Y. Ehrlich and R. Lavi, *Continuous wave intra-cavity periodically-poled lithium niobate optical parametric oscillator*, TOPS Volume 34, Advanced Solid State Lasers, 293 (2000).
8. S. Pearl, S. Fastig, Y. Ehrlich and R. Lavi, *Limited efficiency of a silver selenogallate optical parametric oscillator caused by two-photon absorption*, Appl. Optics **40**, 2490(2001).
9. Marcus,-G.; Zigler,-A.; Englander,-A.; Katz,-M.; Ehrlich,-Y.  *Generation of ultrawide-band chirped sources in the infrared through parametric interactions in periodically poled crystal.* Appl. Phys. Lett. **82**, 164-166 (2003).
10. S. Pearl, Y. Ehrlich, S. Fastig, S. Rosenwaks, *Nearly diffraction-limited signal generated by a lower beam- quality pump in an optical parametric oscillator*, Appl. Opt. **42**, 1048-1051, (2003).
11. Y. Ehrlich, S. Pearl, S. Fastig, *High brightness tunable tandem optical parametric oscillator at 8-12m*, ASSP, G. Quarles ed., Trends in Optics and Photonics v.94, OSA WA-DC, (2004).
12. Gadi Fibich, Shmuel Eisenmann, b. Ilan, Yosi Ehrlich, Moshe Fraenkel, Z. Henis, A.L. Gaeta, Arie Zigler, *Self-focusing distance of very high power laser pulses,* Optics Express, **13**, 5897-5903 (2005).
13. E. Louzon, Z. Henis, S. Pecker, Y. Ehrlich, D. Fisher, M. Fraenkel, A. Zigler, *Reduction of damage threshold in dielectric materials induced by negatively chirped laser pulses.* Appl. Phys. Lett. **87**, 241903 (2005).
14. G. Marcus, A. Zigler, D. Eger, A. Bruner, A. Englander, M. Katz, and Y. Ehrlich, " Generation of a High-Energy Ultra-Wideband Chirped Source in Periodically Poled Crystals," in *Advanced Solid-State Photonics*, Technical Digest, paper MB21. (2006)
15. Gadi Fibich, Yonatan Sivan, Yosi Ehrlich, Einat Louzon, Moshe Fraenkel, Shmuel Eisenmann, Yiftach Katzir, Arie Zigler, *Control of the collapse distance in atmospheric propagation,* Optics Express, **14**, 4946-4957 (2006).
16. S. Eisenmann, Y. Katzir, A. Zuigler, G. Fibich, E. Louzon, Y. Ehrlich, Z. Henis, S. Pecker, D. Fisher and M. Fraenkel, *Intercation of intense short laser pulses with air and dielectric materials*, International Journal of Modern Physics B **21**,615-625 (2007).
17. E. Louzon, Z. Henis, I. Levi, G. Hurvitz, Y. Ehrlich, M. Fraenkel, S. Maman and P. Mandelbaum, *X-ray spectrum in the range of 6-12 Å emmited by laser-produced plasma of samarium,* JOSA B **26**, 959 (2009).
18. E. Louzon, Z. Henis, I. Levy, G. Hurvitz, Y. Erlich, M. Fraenkel, S. Maman, E. Raicher, A. Malka, P. Mandelbaum, Z. Zigler, *Density diagnostic of highly ionized samarium laser produced plasma using Ni-like spatially resolved spectra*, Laser and Part. Beams **29**, 61-67, (2011).
19. J. Papeer, C. Mitchell, J. Penano, Y. Ehrlich, P. Sprangle, and A. Zigler,*Microwave diagnostics of femtosecond laser-generated plasma filaments,* Appl. Phys. Lett. **99**, 141503 (2011).
20. E. Louzon, A. Feigel, Y. Frank, E. Raicher, M. Klapisch, P. Mandelbaum, I. Levy, G. Hurvitz, Y. Erlich, M. Fraenkel, S. Maman, , and Z. Henis, *X-ray spectral measurements and collisional radiative modeling of laser produced iron plasma*, High Energy Density Phys. **7**, 124-129 (2011).
21. E. Louzon, Y. Frank, E. Raicher, P. Mandelbaum, A. Feigel, G. Hurvitz, Y. Erlich, M. Fraenkel, S. Maman, A. Zigler, Z. Henis, *Diagnostics of dielectronic processes in laser produced samarium plasma*, High Energy Density Physics Journal **8**, 81-87 (2012).
22. Gilad Hurvitz, Yosi Ehrlich, Galit Strum, Zeev Shpilman, I Levy, Moshe Fraenkel, *Advanced experimental applications for x-ray transmission gratings spectroscopy using a novel grating fabrication method*, Rev. Sci. Inst. 83, 083109 (2012).
23. E. Louzon, E. Raicher, Y. Frank, A. Tcibulsky, I. Levy, G. Hurvitz, Y. Ehrlich, M. Fraenkel, S. Maman, P. Mandelbaum, A. Zigler, Z. Henis, *Plasma jets produced by low energy laser pulse interaction with planar and cratered targets*, High Energy Density Physics Journal **9**, 505-509 (2013).
24. Z Shpilman, Y Ehrlich, S Maman, I Levy, T Shussman, G Oren, I Zakosky Nueberger, G Hurvitz, *Single-shot calibration of soft x-ray mirrors using a sinusoidal transmission grating*, Rev. Sci. Instrum. **85**, 11E809 (2014).
25. Y. Frank, E. Raicher, Y. Ehrlich, G. Hurvitz, Z. Shpilman, M. Fraenkel, A. Zigler, Z. Henis*,* [*Influence of atomic modeling on integrated simulations of laser-produced Au plasmas*](http://journals.aps.org/pre/abstract/10.1103/PhysRevE.92.053111), Physical Review E **92**, 053111 (2015).‏