

Atomic and Molecular Theory

This is the home page of the IPB Theoretical Atomic and Molecular Physics Group. The main research interests of the group include studies of atomic few-body systems, complex-atom structure calculations, statistical and dynamical properties of atomic systems, atomic processes in strong laser fields, ion-atom collisions and ion collisions with surfaces.

Members:

[Tasko Grozdanov, c.v.](#) , [Publications](#)

[Nenad Simonovic](#)

[Svetlana Vucic Publications](#)

[Istok Mendas](#)

[Duska Popovic](#)

[Petar Grujic](#)

[Vojislav Radojevic](#)

Project 2011-2014: [OI 171020](#)

Institution: Institute of Physics

Contractor: Ministry of Education and Science

Title: Physics of collisions and photo processes in atomic, (bio)molecular and nanosized systems

Contract type: National Research Project

Begin: 1.01.2011 End: 31.12.2014

Leader of the project: [Bratislav Marinkovic](#)

THE STRUCTURE OF ATOMS / IONS AND THEIR INTERACTION WITH ELECTRONS:

Leadership: Petar Grujic and Vojislav Radojevic

By applying different theoretical methods, the quantum state energies and widths of atomic systems will be evaluated.

HEAVY PARTICLE COLLISIONS:

Leadership: Tasko Grozdanov

We shall investigate problems involving non-relativistic fast ion (atom)-atom/molecule collisions. Working within the four- and five-body framework of scattering theory and imposing the proper Coulomb boundary conditions on the entrance and exit channels, the various quantum-mechanical theories will be formulated/implemented. We shall also investigate the slow reactive collisions of ions, atoms and molecules with molecules by using statistical models.

NANO-SIZED SYSTEMS AND ATOM/ION-SURFACE INTERACTION:

Leadership: Nenad Simonovic

Electronic structure and transport properties of/through the nano-sized systems such as: thin films, quantum wells and quantum dots will be studied. The simulation of atomic beam diffraction at a crystal surface will be performed. The influence of metal surface to atomic states will be investigated.

PHOTOPROCESSES:

Leadership: Tasko Grozdanov and Svetlana Vucic

We shall study the effects of the interaction of ultra-short, attosecond electromagnetic pulses with atomic systems. Application of the quantum many body theory to study of the atomic structure and atomic processes, mainly interaction of electromagnetic radiation with atomic systems (neutrals, positive, and negative ions).

QUANTUM INFORMATION:

Leadership: Istok Mendas and Duska Popovic

Theoretical investigations in the field of quantum information and quantum physics, examination of potential applications and comparison with available experimental data will be performed.

Graduate Curriculum:

The Structure of Atoms and Molecules

Scattering Theory

Special Topics I

Special Topics II

Past project: 2006-2010: OI 141029

Institution: Institute of Physics

Contractor: Ministry of Science and Technological Development

Title: Dynamics of atomic, molecular and mesoscopic systems

Contract type: National Research Project

Begin: 1.01.2006 End: 31.12.2010

Leader of the project: Tasko Grozdanov

We shall develop theoretical and computational methods for description of resonance-dominated atomic and molecular radiation and collision processes. Relationship between lifetimes of resonant states and their phase-space structure will be investigated. Atomic collision processes close to thresholds will be studied. We shall investigate quantum-mechanical models for fast ion-atom collisions with two actively participating electrons. Interaction of atoms with solid surfaces will be studied including the ionization of Rydberg atoms and ions within the framework of asymptotic models. Computational and theoretical investigations of many-electron correlations and relativistic effects in atomic processes and in structure of atomic shells will be performed. Photoionization and photoemission spectra of atoms and molecules exposed to intense laser fields will be calculated by using Floquet method and numerical solution of the time dependent Schrodinger equation. Starting from the crucial role of electronic correlations in the structure and transport through quantum dots, the few-electron dots will be studied, particularly in an external magnetic field. The electronic transport through nano-heterostructures (superconducting and nanowire-DNA-nanowire junction) will be studied theoretically and experimentally. We shall investigate theoretically and numerically pure and mixed quantum states that are of importance in quantum optics and quantum information theory.

Past project: 2006-2010: OI

Institution: Institute of Physics

Contractor: Ministry of Science and Technological Development

Title: History and epistemology of science

Contract type: National Research Project

Begin: 1.01.2006 End: 31.12.2010

Leader of the project: Pear Grujic

This interdisciplinary project engages researchers from various sciences, whose primary preoccupation lies in particular disciplines, but who are interested in the history of their scientific fields, as well as in the epistemological aspects of their research. The project gathers 15 researchers from 7 institutions, some of them retired. Participants have been gathered around the seminar with the same title, which has been running since 1995 at the Institute of Physics. The project also aims at the promotion of science as such, with an emphasis on the cultural aspects of the scientific activities.

[Publications 2005 - 2010](#)

Prof. Petar Grujic: [REMEMBERING MIKE](#) Professor Michael J. Seaton

(16.01.1923 – 29.05.2007)

Institute of Physics IPB [home page of Centre 3](#)

[Links to AMO groups and laboratories in Serbia](#)



Professor Petar Grujic, **PhD**, CPhys, FInstP

Scientific adviser

Email: grujic@phy.bg.ac.yu

Phone: +381 11 316-0260

Fax: +381 11 316-2190

Research Interests: few-electron atomic systems, electron-atom collision processes, semiclassical theory, nonlinear dynamics, few-body systems, cosmology, history and epistemology of science.

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 - [Publications](#)
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 - [Personal Presentation](#)
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Curriculum vitae

Biography : Born 1941., at Ovsiste (Topola, Serbia). Spent 1948-59 at Kragujevac, Serbia. Since 1959 lives in Belgrade. Spent 1967/9 academic years in London, as the British Council scholar. Spent 5 months at Grenoble, France, 1974 and 5 months at Orsay, France, 1997.

Education : Grammar school, Kragujevac (1959); Faculty of Physics, Belgrade University (1963); **MSc**, Belgrade University, 1966; **PhD**, University College, London, 1972.

Career : Institute of Physics, Belgrade (1964-). Scientific researcher, 1973; senior scientific researcher, 1979; scientific adviser, 1984. Full professorship, Faculty of Physics, Belgrade University, 1995.

Awards : Institute of Physics awards for the scientific achievements, 1980, 1982.

Publications : Over 50 papers and review articles in the international scientific journals. University textbook *Introduction to the theory of the electron scattering on atoms and molecules*, (in Serbian); monography *Atomic processes near the threshold* (in Serbian).

Pedagogical activities : Supervisor for 6 *MSc* and 4 *PhD* dissertations. Since 1982 part-time chair of the postgraduate studies of Theoretical Atomic and Molecular Physics, at the Faculty of Physics, Belgrade University. Lecturer at the Alternative Academic Educational Network (AAEN), Belgrade, 1999.

Seminars : Founder and chairman of the *DEBATE TRIBUNE* at the Institute of Physics, Belgrade. Founder and chairman of the seminar *HISTORICAL AND EPISTEMOLOGICAL INVESTIGATIONS IN SCIENCES*, at the Institute of Physics.

Referee : J. Phys. B, Physica A, Fizika, SFIN, Serbian Astronomical Journal.

Fellowships : European Physical Society; Institute of Physics (FInstP, GB); Euroscience; Association of Physicists of Serbia; Serbian Philosophical Society, Association of Astronomers of Serbia.

Publications

Textbooks

1. P. Grujic
Introduction to the theory of scattering of electrons on atoms and molecules
Naucna knjiga, Belgrade, 1994 (in Serbian)

Review articles

1. P. Grujic
Classical calculations of the near-threshold multiple-escape processes
Comm. At. Mol. Phys. 18 (1986) 47-74
2. P. Grujic
Newtonian and Coulombic systems
Bull. Astron. Balgrade, No 147 (1993) 15-29 (in Serbian)
3. P. Grujic
Atomic processes near the threshold
SFIN, VII (1) (1994) 1-152 (in Serbian)
4. P. Grujic
Doubly-excited atoms and the line broadening
Bull. Astron. Balgrade, No 152 (1995) 79-94 (in Serbian)
5. P. Grujic
Some recent advances in near-threshold ionization theory
Comm. At. Mol. Phys. 33, No 6 (1997) pp. 351-368.
6. P. Grujic
The concept of fractal cosmos: I. Anaxagoras' cosmology
Serb. Astron. J., No 163 (2001) pp. 21-34.
7. P. Grujic
The concept of fractal cosmos: II. Modern Cosmology
Serb. Astron. J., No 165 (2002) pp. 45-65.
8. P. Grujic
Threshold law for $e + A - \tilde{A} + 2e$ detachment
Physica Scripta, 68 (2003) C90-94.

MSc thesis

- P. Grujic
Calculations of the cross sections for excitations of some hydrogen atom levels by electron impact
Faculty of Science, Belgrade University, 1966 (in Serbian)

PhD disertation

- P. Grujic
A classical theory of threshold laws for electron-atom collisions
University College London, 1972

Original papers

1. P. Grujic
A classical calculation of $e - H$ collisions ionization threshold law
J. Phys. B5 (1972) L137-9
2. P. Grujic
Threshold behaviour of $e - H$ collisional excitation function : classical treatment
J. Phys. B6 (1973) 286-99
3. S. Cvejanovic and P. Grujic
A classical analysis of the ionization threshold vicinity
J. Phys. B8 (1975) L305-9
4. M. S. Dimitrijevic and P. Grujic
Long-range potentials and Stark broadening of neutral lines
J. Quant. Spect. Rad. Tran. 19 (1978) 407
5. P. Grujic
Angular momenta near ionization thresholds for electron-ion collisions
J. Phys. B12(1979) L131-4
6. M. S. Dimitrijevic and P. Grujic
On mutual angle and energy distributions near ionization thresholds for electron-ion collisions
J. Phys. B12 (1979) 1873
7. P. Grujic and D. Koledin
Low-energy electron-excited atom scattering : quasidegenerate case
J. Phys. B12 (1979) L399-402
8. M. S. Dimitrijevic and P. Grujic
Approximate classical trajectories and the adiabatic theory of Stark broadening of neutral-atom lines
Z. Naturforsch. 34a (1979) 1362-4
9. D. Koledin and P. Grujic
Low-energy $e - He(2^1L)$ scattering calculations
Z. Naturforsch. 36a (1981) 132-9
10. M. S. Dimitrijevic and P. Grujic
Electron-helium double ionization near the threshold : numerical investigations
J. Phys. B14 (1981) 1663-74
11. M. S. Dimitrijevic, P. Grujic and S. Vucic
A classical model for $e - He(2s^2)$ elastic scattering
Fizika 13 (1981) 321-9
12. S. Vucic, P. Grujic and V. Radojevic
Elastic scattering of low-energy electrons on $He 2^1S$
Phys. Rev. A24 (1981) 1823-30
13. P. Grujic
A classical model for the $(p + e^- + e^+)$ system
J. Phys. B15 (1982) L195-9
14. P. Grujic
The classical theory of near-threshold ionization
J. Phys. B15 (1982) 1913-28
15. M. S. Dimitrijevic and P. Grujic
The classical trajectory study of $e^+ + A \rightarrow A^+ + e^+ + e^-$ reaction near the threshold
J. Phys. B1 (1983) 279-305
16. P. Grujic, A. Tomic and S. Vucic
A classical model for the low-energy $e^{+(-)} - H(1s)$ elastic scattering
J. Chem. Phys. 79 (1983) 1776-82
17. P. Grujic
The fourfold escape threshold law
Phys. Lett A96 (1983) 233-5 [Errata : Phys. Lett. A122 (1987) 494]
18. P. Grujic
The threshold law for double ionization in electron-atom collisions
J. Phys. B16 (1983) 2567-76
19. P. Grujic
Threshold law for double ionization by positrons
Fizika 15 (1983) 213-24
20. P. Grujic
Semiclassical calculations of $(Z + e^- + e^+)$ energy spectra
J. Chem. Phys. 80 (1984) 61
21. P. Grujic
Energy distribution in the near-threshold electron impact ionization of atoms and ions
Phys. Rev. A30 (1984) 3012
22. M. S. Dimitrijevic and P. Grujic
Langmuir's helium-like models revisited
Z. Naturforsch. 39a (1984) 930
23. M. S. Dimitrijevic and P. Grujic
Classical spectrum of an oscillatory helium model
Fizika 17 (1985) 1
24. N. Simonovic and P. Grujic
Small-energy three-body systems : I. Threshold laws for the Coulombic interaction
J. Phys. B20 (1987) 3427-36
25. P. Grujic
Small-energy three-body systems : II. Rovibronic spectra for the Coulombic interaction
J. Phys. B21 (1988) 63-79
26. P. Grujic and N. Simonovic
Small-energy three-body systems : III. Triatomic threshold fragmentation
J. Phys. B21 (1988) 1845-59
27. P. Grujic
Threshold behaviour of the triple-escape molecular fragmentation functions : I. General theory
Fizika 20 (1988) 409
28. P. Grujic and D. Koledin
Simultaneous excitation-detachment functions for the electron-negative hydrogen ion collisions near the threshold
Z. Phys. D15 (1989) 327-32 [Erratum : Z. Phys. D28 (1993) 1831]
29. M. S. Dimitrijevic, P. Grujic and N. Simonovic
Fourfold ionization by electrons near the threshold
Z. Phys. D15 (1990) 203-9
30. P. Grujic and N. Simonovic
Small-energy three-body systems
Cel. Mech. Dyn. Astr. 45 (1990) 79-94
31. S. Cvejanovic, Z. Dohcevic and P. Grujic
On the widths of doubly excited states of the helium negative ion
J. Phys. B23 (1990) L167-72
32. M. S. Dimitrijevic, P. Grujic, G. Peach and N. Simonovic
Small-energy systems : IV. Classical trajectory calculations for the near-threshold behaviour of collision-induced dissociation
J. Phys. B23 (1990) 1641-53
33. Z. Dohcevic, P. Grujic and J. Jovanovic-Kurepa
Semiclassical study of He^- doubly-excited Rydberg states
Physica A170 (1991) 447-61
34. P. Grujic
Rotating frame of reference paradox
Spec. Sci. Tech. 14 (1991) 154-8
35. P. Grujic and N. Simonovic
The classical helium atom - an asynchronous-mode model
J. Phys. B24 (1991) 5055-61
36. M. S. Dimitrijevic, P. Grujic and N. Simonovic
Small-energy systems : V. Threshold laws when Wannier theory fails
J. Phys. B27 (1994) 5117-30
37. P. Grujic and N. Simonovic
Asymmetrical configurations in Coulombic rigid rotators
Phys. Rev. A50 (1994) 4386-9
38. P. Grujic and N. Simonovic
Semiclassical calculations of intra-shell S resonances of doubly excited helium
J. Phys. B28 (1995) 1159-71
39. P. Grujic
Multiply-excited atoms and the line broadening
J. Appl. Spect. 63 (1996) 831-5
40. P. Grujic and N. Simonovic
 $e + H^-$ detachment function: I. The classical-dynamic study
J. Phys. B31 (1998) 2611-31
41. P. Grujic
Triply excited three-electron systems - semiclassical model
Eur. Phys. J. D6 (1999) 441
42. P. Grujic
A Simple Newtonian Model for the Fractal Accelerating Universe
Astrophysics and Space Science, 295 (2004) 363-374.
43. N. Simonovic, D. Lukic and P. Grujic
Double ionization by positrons near threshold
J. Phys. B38 (2005) 3147-3161.
44. P. Grujic
Some epistemic questions of cosmology
Foundations of Science 12 (2007) 39-83.
45. N. Simonovic and P. Grujic
Quadruply excited beryllium-like atom - a semiclassical model
EPJ D47 (2007) 1-10.
46. V. Djokovic and P. Grujic
Albert Einstein, Cosmos and Religion
Serb. Astr. J., No 174 (2007) 61-72.
47. P. V. Grujic
SOME EPISTEMIC QUESTIONS OF COSMOLOGY
Foundations of Science, 12, No 1 (2007) 39-83.
48. V. Djokovic and P. Grujic
ALBERT EINSTEIN, COSMOS AND RELIGION
Serb. Astr. J., No 174 (2007) 61-72.
49. P. Grujic
COSMOLOGY AND MYTHOLOGY – A CASE STUDY
European Journal of Science and Theology, 3, No 3 (2007) 37-52.
50. N. Simonovic, M. Predojevic, V. Pankovic and P. Grujic
SEMICLASSICAL CALCULATIONS OF THE QUADRUPLY EXCITED FOUR-ELECTRON SYSTEMS
Serb. Astr. J., No 175 (2007) 33-44.

Recent publications

P. Grujic

"Whose famous formula?: Part II"

APS News, January 2001

P. Grujic

"Palimpsest Teaches History, Geography"

Physics Today, May 2001, Vol. 54, No 5, p. 90.

P. Grujic

"Serbian Reforms"

Physics World, May 2001, p. 19.

P. Grujic

"An accelerator in a decelerating society",

Euroscience News, July 2001, p. 12.

P. Grujic

"The Concept of Fractal Cosmos I.: Anaxagoras' cosmology",

Serbian Astr. J., 163, 2001, p. 21-34.

P. Grujic and L. Vuskovic

"Milan Kurepa - Obituary"

Physics Today, August 2001, Vol. 54, No 8, pp. 64-65.

P. Grujic

"Cosmology as our Picture of the World" (in Serbian)

Vasiona, XII, No 1 (2002) pp. 7-12. (In Serbian)

P. Grujic

"First authorship does not determine real leader"

APS News, May 2002, p. 4.

P. Grujic

"Efforts to revive Serbian science"

Nature, 418 (2002), No 6901, p. 915

P. Grujic

"A man for candle"

Milan Kurepa - THE FATE OF RESISTANCE, AM, CUPS (2002) pp. 242-6. Ed. J. Trkulja (In Serbian)

P. Grujic

"A year since death of 'Serbian Saharov'"

Milan Kurepa - THE FATE OF RESISTANCE, AM, CUPS (2002) pp. 254-60. Ed. J. Trkulja (In Serbian)

P. Grujic

"An institute for atomic physics and cosmology"

Europhysics News, May/June 2002, 33, No 3, p. 4

P. Grujic

"New Science in the Old Serbia",

Euroscience News, No 21, Autumn 2002, p. 10.

P. Grujic

"The Concept of Fractal Cosmos II.: Modern cosmology",

Serbian Astr. J., 165, 2002, pp. 45-66.

P. Grujic

"Threshold law for $e + A - \tilde{A} \rightarrow A + 2e$ detachment"

Physica Scripta, 68 (2003) C90-94.

P. Grujic

“Govor neba”

Astronomija, No 11, (2005) 34-40

P. Grujic

“A Simple Newtonian Model for the Fractal Accelerating Universe”

Astrophysics and Space Science, 295 (2004) 363-374.

Petar Grujic

“Einstein and God”

Physics World. Vol. 8, No 4 (2005) 21

P. Grujic

M. Silberman - “A Universe of Atoms, an Atom in the Universe”

Book review, Europhysics News, March/April 2005, p. 70

N. Simonovic, D. Lukic and P. Grujic

“Double ionization by positrons near threshold”

J. Phys. B38 (2005) 3147-3161

P. Grujic

“Some epistemic questions of cosmology”

Foundations of Science 12 (2007) 39-83

N. Simonovic and P. Grujic

“Quadruply excited beryllium-like atoms - semiclassical model”

EPJ D47 (2007) 1-10

V. Djokovic and P. Grujic

“Albert Einstein, Cosmos and Religion”

Serb. Astr. J., No 174 (2007) 61-72

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COSMOLOGY AND MYTHOLOGY – A CASE STUDY

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SEMICLASSICAL CALCULATIONS OF THE QUADRUPLY EXCITED FOUR-

ELECTRON SYSTEMS

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REMEMBERING MIKE

Professor Michael J. Seaton (16.01.1923 – 29.05.2007)

When I applied for the British Council Scholarship 1967 I was to choose a department and mentor for my PhD studies in Great Britain. Browsing the leading journal in atomic physics, Proceedings of the Physical Society (now Journal of Physics B) I came across three linked papers by M. J. Seaton, dealing with electron-hydrogen scattering. (Later these papers turned out foundation of the so-called exact resonance method, one of few exactly analytically solvable methods in atomic physics). I decided to apply for the University College London and Seaton's mentorship and thus my long-term acquaintance with Mike Seaton began.

It happened that just before going to London, I attended my first international conference, held at Leningrad (now St Petersburg). Two remarkable events marked that meeting on the Atomic Physics. One was the exposition of the Fadeev equations, now famous quantum mechanical solution of the three-body problem, made by the very author. The other was presentation of the purely classical calculations of the atomic collision processes, made by Michael Gryzinski (Warsaw) and Ian Percival (Queen Mary College, London). In particular Percival presented results which corroborated earlier analytical solution of the near-threshold ionization by electrons, made by Wannier in 1953. All participants were very skeptical about the possibility of making use of the classical dynamics in atomic physics, but the classical dynamics was to stay there for long ever since.

When I arrived at UCL, Mike gave me the task to prove classically that his linear threshold law, derived purely quantum mechanically, was correct. Making use of Percival's numerical code I reproduced Wannier's result, non-linear threshold law, instead of Mike's linear one. Incidentally, about the same time American experimentalists confirmed Wannier's result and Mike himself provided me with their paper. So, the issue was more or less closed and Wannier's theory turned out to be one of the greatest achievements in atomic physics ever since.

British Council awards students for one year, but exceptionally provides scholarship for another year, if the scholar starts his PhD work, what depends on the mentor's decision. Mike turned out very generous indeed and I continued my work on the thesis.

Mike was born in Bristol, and went to Grammar School at Surrey, where he was awarded a prize in chemistry. During the war he served as Flight Lieutenant on RAF bombers, mainly over Italy. He enrolled University College London, the oldest, after Oxford and Cambridge, in England (1830), where he graduated and got his PhD. (As I was told Mike was the best student of David Bates, who himself was the best student of Sir Harry Massy, the leading figure in the field of atomic collisions, and who was still the head of the Department when I arrived to UCL). His principal interests lied in atomic physics and astrophysics. As he used to say, he was not sure himself if he was an atomic physicist disguised as astrophysicist or vice versa. Besides the exact resonance method, mentioned above, one of his main contributions to the theoretical atomic physics was the so-called Quantum Defect Theory, which he developed in dozens of papers. It concerns applying the concept of quantum defect, used in the theory of atomic structure, to the collision processes.

In astrophysics Mike was mainly interested in the study of the so-called planetary nebulae, examining their spectra. It required a very elaborate theory of the atomic structures and spectra, which was developed at UCL. Mike frequently visited leading European astronomical observatories, like that at Meudon near Paris, and some in Spain, making use of the fresh raw observational material for his calculations. Some of his students continue this research.

When I had my PhD defense at UCL in 1972, that year Departments of Physics and Astronomy merged, and Mike was elected the Fellow of the College. He retired in 1988, but held the status of Professor Emeritus. He moved from London, with his wife Joy, to a cottage in Wales, where he continued to work and publish scientific papers to the end of his life.

Mike Seaton was Fellow-Adjont of JILA at Bolder, Colorado. He was elected Fellow of the Royal Society in 1967. He was honorary member of the American Astronomical Society from 1983, and Foreign Associate of the US National Academy of Science since 1986. Between 1979 and 1981 Seaton was president of the Royal Astronomical Society. Among other awards Mike received Gold Medal (1983), Guthrie Medal and Prize (1984), and Hughes Medal of the Royal Society (1992). He served as the Senior Fellow to the Science and Engineering Research Council (1984-88).

Mike was an exceptionally genuine person, modest and restrained. It was only during my second year stay at UCL that I learned he was FRS. When I returned to Belgrade in 1969, I learned from Mike that his mother, Helen, was a volunteer medical nurse in Serbia during the Great War. Solders were fond of her and called her »little Helen«. I sent to her from Belgrade Mokranjac's »Rukoveti«, she wrote a letter of thankfulness to me and it was how a correspondence with her started. When she died Mike read a part of one of my letters at the funeral. Helen was a Quaker, devoted to charity work. She dedicated her body to medical research, as the last act of mercifulness. Mike himself asked that his body be buried in an ecologically appropriate way, as it was done indeed.

Mike was much respected by his colleagues and loved by his students. He never signed a paper unless his contribution was essential. When I submitted to him the paper from my PhD thesis, with his name first, expecting that he would eventually put his name second, he simply took a pencil and crossed his name altogether. He told me before that his order of authors was alphabetical one, except for the first paper by a young author (»in order to encourage him«. I have stuck to this rule until my retirement).

Mike was leftist for all his life. Shocked by Chamberlain's failure at Munich, he joined the Young Communist League in 1938, what he had to pay for by police persecution. (When the war started, Mike volunteered for RAF). After Soviet intervention in Hungary, 1956, Mike left the Communist party. Once he told me that he found that many parts from the original of Marx's »Capital« were omitted in later editions.

The world of physics has lost one of its most prominent researchers and educators. Serbia has been linked with Mike in many ways. It was via Mike that the theory of electron-atom collisions has been introduced here and in a somewhat more indirect way, via his collaborator Dr Gillian Peach (who used to hold the subject at the post-graduate level at UCL), the theory of line broadening. Mike visited Belgrade for a conference in 1973, stayed here for a week, but our memory on him will keep him in Serbia for long time.

Petar Grujic

28.06.2007.

Zemun

Department of Physics and Astronomy
UNIVERSITY COLLEGE LONDON
GOWER STREET LONDON WC1E 6BT

Telex: 28722 UCPHYS-G
Fax: 01-380 7145

Tel: 01-387 7050 (Ext.)
Direct Line: 01-380

1988 June 10th

Dear Colleague,

ATOMS, MOLECULES AND ASTROPHYSICS
Symposium in Honour of Professor M.J. Seaton F.R.S.

As you may well be aware, Professor Seaton retires on 1988 September 30th. While it is expected that formal retirement will in no way mark the end of Mike Seaton's very distinguished career, University College London wishes to honour the occasion with a one-day symposium to be followed by a dinner. We wish to invite you to the Symposium being held on 1988 September 30th; a list of speakers is enclosed.

If you would like to attend the symposium or the dinner (or both), please complete the enclosed form and return it to one of the undersigned at your earliest convenience. Should you need accommodation in London, please also indicate the nights of interest on the enclosed form.

Yours sincerely,

Gillian Peach

P. J. Storey

Tony

Gillian Peach

P.J. Storey

A.E. Lynas-Gray