

# CURRICULUM VITAE OF JOHAN F PRINS

## CURRICULUM VITAE

**NAME:** JOHAN FRANS PRINS.

**DATE OF BIRTH:** 21 JANUARY 1942.

**PLACE OF BIRTH:** SPRINGS, SOUTH AFRICA

### **EDUCATION:**

- Dec. 1958** National Senior Certificate (with distinctions in Mathematics, Physics and Chemistry, Biology and English): This matriculation examination was written after studying by correspondence during the same year standard 9 (grade 11) was completed at high school.
- Dec. 1961** BSc (Physics & Math.), University of Pretoria (cum laude).
- Feb. 1964** MSc (Physics), University of Pretoria (cum laude).
- Nov. 1966** DSc (Materials Science), University of Virginia, U.S.A.

### **CAREER:**

- 1967-1967** SENIOR LECTURER & ACTING HEAD OF PHYSICS, University of Port Elizabeth.
- 1968-1971** SENIOR RESEARCH OFFICER, De Beers Diamond Research Laboratory, Johannesburg.
- 1972-1977** SENIOR LECTURER, University of Pretoria, and Consultant to De Beers Industrial Diamond Division.
- 1978-2002** Funded by De Beers Industrial Diamonds (Pty) Ltd. to investigate the applications of ion implantation into diamond and the possibility of utilizing diamond for electronic purposes.
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- 1983 - 1996:** Honorary Senior Research Associate at University of the Witwatersrand.
- 1997 - 1999** Honorary Professor at the University of the Witwatersrand.
- 2000 -** Honorary Professor at the University of Pretoria.
- 2002 -** Director: **Sage Wise 66 (Pty) Ltd.** Trading as CATHODIXX.

### **SPECIAL HONOURS:**

1. Listed in Marquis' **Who's Who in the World**, and in **Who's Who in Science and Technology**.
2. Nominated for inclusion in the 2002 edition of "America's Top One Thousand".
3. Lectured at the prestigious International School of Physics "Enrico Fermi": on **Applications of Diamond Films in Electronics** (4 lectures), Course CXXXV: "The Physics of Diamond", Directors A Paoletti and A Tucciarone, Villa Monastero, Varenna, Italy, 23 July - 2 Aug. 1996.
4. Has been a member of the International Steering Committee of the European Conference Series on **Diamond Films and Related Materials**: 1993-2005
5. Has been a member of the International Advisory Committee as well as Programme Committee for the **International Conferences on New Diamond Science and Technology (ICNDST)**: 1990-2005.
6. Was Chairman of the Organising Committee for the **6th International Conference on New Diamond Science and Technology (ICNDST-6)**, which was held in Pretoria, South Africa, from 31 August to 4 September 1998.

### **MEMBERSHIPS:**

Elected to the Bohmische Physical Society for contributions to the study of Ion Implantation in Diamond (1990).

### **PREVIOUS MEMBERSHIPS:**

South African Institute of Physics: Resigned in 2007.  
Sigma Xi: USA Association for the Advancement of Science  
AAAS: American Association for the Advancement of Science.

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AIME: American Institute of Metallurgical Engineers

ASM: American Society for Metals

<b><u>PATENTS:</u></b>	17
<b><u>TOTAL REFEREED PUBLICATIONS:</u></b>	91
<b><u>REFEREED SOLO PUBLICATIONS:</u></b>	61
<b><u>CLASSIFIED INDUSTRIAL RESEARCH:</u></b>	Equivalent to 50 publications
<b><u>INVITED TALKS:</u></b>	66
<b><u>SUBMITTED CONTRIBUTIONS TO CONFERENCES:</u></b>	89

## **LIST OF REFEREED PUBLICATIONS:**

1. J F Prins & H G F Wilsdorf,  
Dislocation interactions in the immediate vicinity of a free surface, *Can. J. of Physics*, **45** (1967) 1177-1187.
2. J F Prins & H G F Wilsdorf,  
The calculation of passing distances for dislocations near free surfaces, in "DEFORMATION OF METALS" Ed. J P Hirth (Gordon and Breach, 1968) p. 177-194.
3. J F Prins, D R Harding & G S James,  
An apparatus for testing single diamond particles under simulated working conditions, "DIAMOND RESEARCH 1970", A supplement to *Industrial Diamond Review*, p. 11-18.
4. J F Prins,  
Single diamond particle interaction on steel, *Industrial Diamond Review*, Sept. 1971, p. 364-370.  
also  
Wechselwirkung zwischen Diamanten und Stahl in Einkornversuchen, *Industrie Diamanten Rundschau*, **6** (1972) 19-27.
5. J F Prins,  
A study of single diamond particle interaction on alumina, *Industrial Diamond Review* Dec. 1971, p. 497-503.  
also  
Wechselwirkung zwischen Diamanten und Aluminiumoxidkeramik in Einkorn-versuchen, *Industrie Diamanten Rundschau*, **6** (1972) 94-101.
6. D M Busch & J F Prins,  
A basic study of the diamond grinding of alumina, *National Bureau of Standards special publication #348*, (1972) p. 73-87.
7. J F Prins,  
Microcutting: a method to study surface plasticity at very high strain rates, in "SURFACE EFFECTS IN CRYSTAL PLASTICITY", Ed. R M Latanision and J T Fourie (Noordhof, Leiden 1977), p. 925-929.
8. L J Bredell & J F Prins,  
Microcutting of steel using pyramidal diamonds with different apex angles, *Wear*, **76** (1982) 177-187.
9. L J Bredell & J F Prins,  
Microcutting of steel, copper and zinc: a comparative study, *Wear*, **82** (1982) 127-135.
10. V von Wimmersperg, J F Prins & T E Derry,  
Rotating powder target for ion implantation, *Nucl. Instrum. and Methods*, **197** (1982) 597-598.
11. J F Prins,  
Bipolar transistor action in ion implanted diamond, *Appl. Phys. Letters*, **41** (1982) 950-952.
12. J F Prins,  
Electrical resistance of diamond implanted at liquid nitrogen temperature with carbon ions, *Rad. Effects Letters*, **76** (1983) 79-82.
13. J F Prins,  
Cessation of flow between Bridgman anvils, *High Temp.- High Press.*, **15** (1983) 21-26.

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14. J P F Sellschop, J F Prins & U von Wimmersperg,  
High temperature implantation of powders using a horizontal ion beam, in "ION IMPLANTATION: EQUIPMENT AND TECHNIQUES" Springer Series in Electrophysics II, Ed. H Ryssel and H Glawischnig, (1983) p. 186-188
15. J F Prins,  
Electronic devices in diamond by means of ion beam amorphised layers, in "ULTRAHARD MATERIALS: APPLICATION AND TECHNOLOGY", Ed. P Daniel (Hornbeam, Berkshire, England, 1983) **2**, 15-25.
16. E Friedland, B J E van Tonder & J F Prins,  
Radiation damage in InSb single crystals by alpha-particle bombardment, Nucl. Instrum. and Methods, **218** (1983) 658-662.
17. J P F Sellschop, J F Prins, U von Wimmersperg, M Tredoux & M Rebak,  
Ion beam analysis of powdered samples, Nucl. Instrum. and Methods, **218** (1983) 593.
18. J F Prins,  
A semi-empirical description of pressure generation between Bridgman anvils, High Temp.- High Press., **16** (1984) 657-664.
19. J F Prins,  
Onset of hopping conduction in carbon-ion-implanted diamond, Phys. Rev. B, **31** (1985) 2472-2478.
20. E Friedland, J B Malherbe, H W Alberts, R E Vorster & J F Prins,  
Damage profiles in copper single crystals after ion implantation, S.A.J. of Physics, **9** (1986) 135-138.
21. J F Prins, T E Derry & J P F Sellschop,  
Volume expansion of diamond during ion implantation, Phys. Rev. B, **34** (1986) 8870-8874.
22. J F Prins, T E Derry & J P F Sellschop,  
Volume expansion of diamond during ion implantation at low temperature, Nucl. Instrum. and Methods, **B18** (1987) 261-263.
23. J F Prins & F A Raal,  
Optical absorption of diamond implanted with nitrogen ions, Radiation Effects Express, **1** (1987) 1-7.
24. J F Prins,  
Activation of boron-dopant atoms in ion-implanted diamonds, Phys. Rev. B, **38** (1988) 5576-5584
25. J F Prins,  
Improved activation of boron-dopant atoms implanted into diamond, Nucl. Instrum. and Methods, **B35** (1988) 484-487.
26. T E Derry, J F Prins, C C P Madiba, J Ennis, R A Spits & J P F Sellschop,  
Nuclear reaction profiling of implanted <sup>13</sup>C interstitial redistribution in diamond, Nucl. Instrum. and Methods, **B35** (1988) 431-434.
27. G S Sandhu, W K Chu, M L Swanson and J F Prins,  
A study of the doping process in diamond by boron implantation, SPIE (Proc. Soc. Photo opt. Instr. Engineers: Diamond Optics) **969** (1989) 37-49.
28. J F Prins,  
Fermi-Dirac statistics and the nature of the compensating donors in boron-doped diamond layers, Phys. Rev. B, **39** (1989) 3764-3770.
29. J F Prins,  
Preparation of ohmic contacts to semiconducting diamond, J. of Phys. D: Appl. Phys., **22** (1989) 1562-1564.
30. F P Doty, W A Jesser, Jeyasingh Nithianandam & J F Prins,  
Diamond thin films grown on single crystal substrates by capacitively coupled RF-plasma CVD, Proceedings of the DIAMOND TECHNOLOGY INITIATIVE SYMPOSIUM, 11-13 July 1989, Crystal City, Virginia.

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31. R A Spits, T E Derry, J F Prins & J P F Sellschop,  
Depth profiling of implanted <sup>13</sup>C in diamond as a function of implantation temperature,  
Nucl. Instrum. and Methods, **B51** (1990) 247-252.
32. J F Prins,  
Diamond devices in electronics: new impetus to an old dream, S. Afr. J. of Science, **86** (1990)  
485-486.
33. J F Prins,  
Annealing effects when activating dopant atoms in ion-implanted diamond layers, Nucl. Instrum.  
and Methods, **B59/60** (1991) 1387-1390.
34. R A Spits, T E Derry, J F Prins and J P F Sellschop,  
The redistribution of implanted atoms and radiation damage during the implantation doping of  
diamond, Nucl. Instrum. and Methods, **B59/60** (1991) 1366-1371.
35. J F Prins and H L Gaigher,  
A TEM study of layers grown on copper using carbon-ion-implantation, Proc. Int. Conf. New  
Diamond Science and Technology (ICNDST'90), eds. R. Messier, J. T. Glass, J. E. Butler and  
R. Roy ( Mat. Res. Soc. Pittsburgh 1991) p. 561-566
36. J F Prins,  
Point defect interactions when annealing diamonds implanted at low temperatures, Phys. Rev. B, **44**  
(1991) 2470-2479.
37. J F Prins,  
Ion beams and diamond: modification, doping and simple devices,  
in "APPLICATIONS OF DIAMOND FILMS AND RELATED MATERIALS" eds. Y. Tzeng,  
M. Yoshikawa, M. Murakawa & A. Feldman (Elsevier Science Publishers B.V., 1991) pp. 327-  
334.
38. J F Prins,  
Materials modification - doping of diamond by ion implantation, J. Materials Sci. & Eng. B, **B11**  
(1992) 219-226.
39. J F Prins,  
Ion implanted structures and doped layers in diamond, Mat. Sci. Reports., **7** (1992) 271-364.
40. R A Spits, T E Derry and J F Prins,  
Annealing studies on ion implanted diamond, Nucl. Instrum. Meth., **B64** (1992) 210-214.
41. J F Prins,  
Ion implantation and diamond: some recent results on growth and doping, Thin Sol. Films, **212**  
(1992) 11-18.
42. J F Prins,  
Modification, doping and devices in ion implanted diamond: The properties of natural and synthetic  
diamond, ed. J E Field (Academic Press, 1992) p. 301-341.
43. J F Prins,  
Residual defect control when doping thin layers in diamond, Physica B, **185** (1993) 132-143.
44. H A Hoff, D J Vestyck, J E Butler and J F Prins,  
Ion-implanted, out-diffusion produced diamond thin films, Appl. Phys. Lett., **62** (1993) 34-36.
45. J F Prins,  
Non-CVD methods of diamond growth at low pressures, Diamond and Related Materials, **2** (1993)  
646-655.
46. J F Prins,  
Ion beam modification and dopant activation in diamond, Nucl. Instrum. and Methods, **B80/81**  
(1993) 1433-1440.
47. J F Prins,  
Doping and diode formation in diamond by means of ion implantation, S.Afr.J. Phys., **1/2** (1993)  
12-16.
48. R A Spits, J F Prins, J D Comins & T E Derry,  
A channelling and optical absorption investigation on defect generation in ion-implanted diamond,  
S.Afr.J. Phys., **1/2** (1993) 17-21.

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49. J F Prins,  
Implanting knowledge of diamond and graphite, *Physics Today*, **4** (1993) 65.
50. R A Spits, J F Prins & T E Derry  
A determination of the critical damage density for "amorphization" of ion-implanted diamond, *Nucl. Instrum Methods*, **B85** (1994) 347-351
51. J F Prins,  
Cathodoluminescence as a probe to study residual radiation damage in ion-implanted diamond, *Advanced Materials '93 I/B: Magnetic, Fullerene, Dielectric, Ferroelectric, Diamond and Related Materials*, edited by M. Homma et al. *Trans.Mat. Res. Soc. Jpn.*, **14B** (1994) 1571-1574
52. J F Prins,  
Cathodoluminescence and electroluminescence in ion-implanted type II diamonds, *Diamond & Related Materials*, **3** (1994) 922-925.
53. J F Prins,  
Optical studies on ion-beam-doped diamond layers, *ADVANCES IN NEW DIAMOND SCIENCE AND TECHNOLOGY*, edited by S. Saito, N. Fujimori, O. Fukunaga, M. Kamo, K. Kobashi and M. Yoshikawa, (MYU Tokyo, Japan 1994) p. 443-448
54. S R Rotman, G E Aizenberg, J F Prins and E Luria,  
Cathodoluminescent measurements of europium-manganese-doped lanthanummagnesium hexaaluminate, *Chem Phys. Lett.*, **228** (1994) 57-60.
55. J F Prins,  
Ion-implanted n-type diamond: electrical evidence, *Diamond & Related Materials*, **4** (1995) 580-585.
56. J F Prins,  
Increased band-A cathodoluminescence after carbon-ion implantation and annealing of diamond, *Diamond & Related Materials*, **5** (1996) 907-913.
57. J. F. Prins,  
Diamond as an active electronic material: prospects for n-type doping, *Industrial Diamond Review*, **56** (1996) 22-29.
58. T Tshepe, J F Prins and M J R Hoch,  
Transport studies in boron-ion implanted type IIa diamond, *Proc. 21st Int. Conf. on Low Temp. Physics Czechoslovak J. Physics*, **46** (1996), Suppl. S5, 2439-2440.
59. T Tshepe, J F Prins and M J R Hoch,  
Percolative transition in carbon-ion implanted type IIa diamond, *Proc. 21st Int. Conf. on Low Temp. Physics Czechoslovak J. Physics*, **46** (1996), Suppl. S5, 2441-2442.
60. J F Prins,  
Applications of diamond films in electronics, *Proc. International School of Physics "Enrico Fermi", Course CXXXV: "The Physics of Diamond"*, A Paoletti and A. Tucciarone (Eds.), IOS Press Amsterdam, 1997, pp. 411-484.
61. S R Rotman, J F Prins and E Luria,  
Concentration effects and energy transfer in the cathodoluminescence of Europium-Manganese-doped Lanthanum Magnesium Hexaaluminate. *Phys. Stat. Sol. (a)* **164** (1997) 845-850.
62. J F Prins,  
Doping of diamond by the diffusion of interstitial atoms into layers containing a low density of vacancies, *Diamond & Related Materials*, **7** (1998) 545-549.
63. J F Prins,  
Ultra-violet cathodoluminescence from diamond layers after doping by means of boron-ion implantation, *Appl. Phys. Lett.* **73** (1998) 2308-2310.
64. J F Prins,  
Recombination luminescence from defects in boron-ion implantation-doped diamond using low fluences, *Mat. Res. Innovat.* **1** (1998) 243-253.

## CURRICULUM VITAE OF JOHAN F PRINS

65. J F Prins,  
Ion implantation of diamond below the amorphization threshold: defects, impurities and their interactions, Proc. 5th International Symposium on Advanced Materials (ISAM'98), Tsukuba, Japan, March 1-5, 1998, pp.93-96.
66. J F Prins  
Recent results on the preparation of doped layers, contacts, and interfaces in diamond by means of ion implantation, *Diamond Films and Technology* **8** (1998) 181-194.
67. J F Prins  
Towards improving the quality of semiconducting diamond layers doped with large atoms, *Diamond Relat. Mater.* **8** (1999) 1635-1641.
68. S R Naidoo and J F Prins  
Electroluminescence from electron injection junctions created by carbon and phosphorous ion implantation, *Diamond Relat. Mater.* **8** (1999) 1502-1507.
69. T Tshepe, J F Prins and M J R Hoch  
Metal-insulator transition in boron-ion implanted type IIa diamond, *Diamond Relat. Mater.* **8** (1999) 1508-1510.
70. J F Prins  
n-Type semiconducting diamond by means of oxygen-ion implantation, *Phys. Rev. B* **61** (2000) 7191-7194.
71. J F Prins  
Erratum: Point-defect interactions when annealing diamonds implanted at low temperatures, *Phys. Rev. B.* **62** (2000) 726-726.
72. J F Prins  
Electrical conduction in diamond after vacancy-generation by means of carbon-ion implantation, *Appl. Phys. Lett.* **76** (2000) 2095-2097.
73. J F Prins and T E Derry  
Radiation defects and their annealing behaviour in ion implanted diamonds, *Nucl. Instrum. Meth. B* **166/167** (2000) 364-373.
74. J F Prins  
The nature of radiation damage in diamond: Activation of oxygen donors. *Diamond Relat. Mater.* **9** (2000) 1275-81.
75. J F Prins  
n-Type doping of diamond by ion implanted group VI atoms. Proc. of the 196th Meeting of the Electrochemical Society, Hawaii Oct. 1999, *DIAMOND MATERIALS VI*, Eds. J L Davidson, W D Brown, A. Gicquel, B V Spitsyn and J C Angus (The Electrochemical Society, Pennington, NJ, (2000) p 216-224.
76. J F Prins  
On the annihilation of vacancies by diffusing interstitial atoms in diamond. *Diamond Relat. Mater.* **9** (2000) 1835-9.
77. J F Prins  
Physics and Chemistry of Semiconductors: Diamond  
Requested contribution: to *The Encyclopaedia of Materials: Science and Technology* (2001)
78. J F Prins  
Large dopants in diamond in "Properties, growth and applications of diamond" eds. M H Nazaré and A. J. Neves, EMIS datareview series No. 26, (INSPEC, London 2001) p.331-6.
79. J. F. Prins  
Irradiating diamond: Aspects of defect generation, accumulation and annealing. *Radiat. Effects and Defects in Solids*, **156** (2001) 173-9.
80. J F Prins  
Vacancy diffusion and trapping in electron-irradiated type IaA diamonds, *Diamond Relat Mater.* **10** (2001) 87-93.

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- 81 J F Prins  
Using ion implantation to dope diamond – an update on selected issues, *Diamond Relat. Mater.* **10** (2001) 1756-1764.
- 82 J F Prins  
On the graphitization threshold and related variable-range-hopping conduction in ion-implanted diamond, *J. Phys D: Appl. Phys.* **34** (2001) 2089-96.
- 83 J F Prins  
C<sup>+</sup>-damaged diamond: electrical measurements after rapid thermal annealing to 500 °C, *Diamond Relat. Mater.* **10** (2001) 463-8
- 84 J. F. Prins  
Ballistic self-annealing during ion implantation, *J. Phys. D: Appl. Phys.* **34** (2001) 3003-3010.
- 85 J. F. Prins  
Nitrogen-related n-type conduction with low thermal activation in diamond, *Semicond. Sci. Technol.* **16** (2001) L50-L52.
- 86 J. F. Prins  
Implantation-doping of diamond with B<sup>+</sup>, C<sup>+</sup>, N<sup>+</sup> and O<sup>+</sup> ions using low temperature annealing, *Diamond Relat. Mater.* **11** (2002) 612-617.
- 87 J. F. Prins  
The quest for Superconduction at room temperature – how close are we? *Science in Africa* (2002): <http://www.scienceinAfrica.co.za>.
- 88 J F Prins  
Ion implantation of diamond for electronic applications, (invited contribution) *Semicond. Sci. Technol.* **18** (2003) S27-S23.
- 89 J. F. Prins  
Part I: A model of the interface between an n-type semiconductor, with negative electron affinity, and the vacuum, *Semicond. Sci. Technol.* **18** (2003) S125-S130.
- 90 J. F. Prins  
Part II: Electron extraction from n-type diamond: evidence for superconduction at room temperature, *Semicond. Sci. Technol.* **18** (2003) S131-S140.
- 91 J. F. Prins  
Ion-implanted, shallow-energy, donor centres in diamond: the effect of negative electron affinity, *Nucl. Instrum. Methods A* **514** (2003) 69-78.

### **INVITED TALKS**

#### **1. Conferences and Symposia**

1. J F Prins,  
Single diamond particle interaction on steels, DWMI (Diamond Wheelmakers Institute) seminar, Shannon, Ireland 31 May - 1 June 1971.
2. J F Prins,  
Grinding. Surface Techniques Symposium, (Solid State Committee, SAIP) University of Pretoria, Pretoria, 1973.
3. J F Prins,  
Electrical conductivity of carbon ion implanted diamond. Symposium on the DEFECT SOLID STATE 1982, Randburg, South Africa, 20-21 July, 1982.
4. J F Prins,  
Ion implantation in diamond. Symposium on ION IMPLANTATION: THEORY, PRACTICE AND APPLICATIONS, SAIP-Conference, Pretoria, 11 July 1983.
5. J F Prins,  
Materials modification - doping of diamond by ion implantation. EMRS conference, Strassbourg, France, 27-30 Nov. 1990.
6. J F Prins,  
Device physics involving ion implanted diamond. DIAMOND CONFERENCE, Oxford, England, 7-10 July 1991.

## CURRICULUM VITAE OF JOHAN F PRINS

7. J F Prins,  
Residual defect control when doping thin layers in diamond. Wide Band Gap Semiconductor Conference, ICTP, Trieste, Italy, 8-12 June 1992.
8. J F Prins,  
Non-CVD methods of diamond growth at low pressures, Diamond 92, Heidelberg, Germany, 31 Aug.- 4 Sept. 1992.
9. J F Prins,  
Ion beam modification and dopant activation in diamond, IBMM 92 (Ion Beam Modification of Materials), Heidelberg, Germany, 7-11 Sept. 1992.
10. J F Prins,  
Electronic applications of diamond coatings, Workshop on applications for diamond films and coatings, Interface Analysis Centre, University of Bristol, Bristol United Kingdom, 26 April 1993.
11. J F Prins  
Ion beam processing of diamond, American Physical Society Annual Conference, Pittsburgh, U.S.A., March 1994.
12. J F Prins,  
Optical studies on ion-beam-doped diamond layers, ICNDST-4 Conference, Kobe, Japan, July 1994.
13. J F Prins,  
The engineering of point defect interactions to activate phosphorus and boron dopant atoms in ion implanted diamonds, Solid State Symposium on "Particle and Radiation Interaction with Materials", SAIP, Pretoria, South Africa, 2 July 1996.
14. J F Prins,  
Applications of diamond films in electronics (4 lectures), International School of Physics "Enrico Fermi" Course CXXXV: "The Physics of Diamond", Directors A Paoletti and A Tucciarone, Villa Monastero, Varenna, Italy, 23 July - 2 Aug. 1996.
15. J F Prins,  
Ion implantation of diamond below the amorphisation threshold: Defects, impurities and their interactions, 5th NIRIM International Symposium on Advanced Materials, ISAM'98, Tsukuba, Japan, 1-5 March 1998.
16. J F Prins  
Recent results on the preparation of doped layers, contacts, and interfaces in diamond by means of ion implantation, 2nd Symposium on Diamond Electronic Devices, ISDED-2, Osaka University, Osaka, Japan, 9-10 March 1998.
17. J F Prins and T E Derry  
Radiation defects and their annealing behaviour in ion implanted diamonds, 10th International Conference on Radiation Effects in Insulators (REI-10), Friedrich-Schiller-Universität, Jena, Germany, 18-23 July 1999.
18. J F Prins  
n-Type doping of diamond by ion implanted group VI atoms  
196th Meeting of the Electrochemical Society, Hilton Hawaiian Village, Hawaii, 17-22 October 1999.
19. J F Prins  
Irradiating diamond: Aspects of defect generation, accumulation and annealing, International Conference on Defects in Insulating Materials (ICDIM) Eskom Conf. Centre, Johannesburg-Midrand, South Africa, 3-7 April 2000.
20. J F Prins  
Using ion implantation to dope diamond – an update on selected issues, 7<sup>th</sup> International Conference on New Diamond Science and Technology (ICNDST-7), City University of Hong Kong, Hong Kong, 24-28 July 2000.
21. J F Prins  
n-Type diamond with negative electron affinity: superconduction at room temperature. IOP Conference, Brighton, England, April 2002.



## CURRICULUM VITAE OF JOHAN F PRINS

22. J F Prins  
Ion-implanted, shallow-energy, donor centres in diamond: the effect of negative electron affinity. 4<sup>th</sup> International Conference on Radiation Effects on Semiconductor Materials, Detectors and Devices. RESMDD'02. Florence, Italy 10-12 July 2002.

### 2. Institutions

1. J F Prins,  
Diamond and ion implantation, Dept. of Materials Science, University of Virginia, U.S.A., July 1980.
2. J F Prins,  
“Enkele elektriese verskynsels wanneer diamante met ione ge-implanteer word”, Dept. of Physics, University of Pretoria, 19 May 1983.
3. J F Prins,  
“Puntdefekinteraksies in ionbestraalde diamant”, Dept. of Physics, Rand Afrikaans University (Now University of Johannesburg), 25 Oct. 1983.
4. J F Prins,  
Electrical Properties of carbon-ion-implanted layers in diamond, Dept. of Materials Science, University of Virginia, U.S.A., 7 August 1984.
5. J F Prins,  
Volume expansion of diamond during ion implantation, Schonland Research Centre, University of the Witwatersrand, 13 May 1986.
6. J F Prins,  
Boron doping of diamond by means of ion implantation, Dept. of Physics and Astronomy, University of North Carolina at Chapel Hill, North Carolina, U.S.A., 22 July 1987.
7. J F Prins,  
Semiconducting diamond layers by means of ion implantation, Dept. of Materials Science, University of Virginia, U.S.A. 5 August 1987.
8. J F Prins,  
Activation of dopant atoms in ion implanted diamond, Dept of Physics, University of Pretoria, 5 Nov. 1987.
9. J F Prins,  
Ion doping of diamond: Electronics of the future! Schonland Research Centre, University of the Witwatersrand, 10 March 1988.
10. J F Prins,  
Doping of diamond by means of ion implantation, Institut für Kernforschung, Karlsruhe, Germany, 22 June 1988.
11. J F Prins,  
Research on diamonds, Max-Planck-Institut für Kernphysik, Heidelberg, Germany 24 June 1988.
12. J F Prins,  
The mechanisms involved when doping diamonds by means of ion implantation, Dept. of Physics and Astronomy, University of North Carolina at Chapel Hill, North Carolina, U.S.A., 18 July 1988.
13. J F Prins,  
Acceptor-donor interaction in boron-doped diamond layers, Dept. of Materials Science, University of Virginia, U.S.A., 18 August 1988.
14. J F Prins,  
A real cool way to dope diamonds,  
Naval Research Laboratory, Electronics Science and Technology Division: Microwave Technology Branch, Washington DC, U.S.A., 25 August 1988.
15. J F Prins,  
Changing the electronic properties of diamond by means of ion implantation, Dept. of Materials Science & Engineering, North Carolina State University, Raleigh, NC, U.S.A., 8 Sept. 1988.

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16. J F Prins,  
Properties of semiconducting diamond layers generated by means of ion implantation, Dept. of Physics and Astronomy, University of North Carolina at Chapel Hill, 13 Sept. 1988.
17. J F Prins,  
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35. J F Prins,  
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Ion implanted damage in covalent solids: how to dope diamond n-type,  
Dept. of Materials Science and Engineering, School of Engineering and Applied Science, University of Virginia, Charlottesville, USA, 28 October 1999.
39. J F Prins  
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40. J F Prins  
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41. J F Prins  
Superconducting electrons in vacuum, Department of Physics, Rand Afrikaans University, (Now the University of Johannesburg), 18 March 2003.
42. J F Prins  
Surface effects of, and superconduction by, diamond, Dept. of Chemical Engineering, Case Western University, Cleveland, Ohio, USA, 2 October 2003.
43. J F Prins  
n-Type diamond and superconduction at room temperature, Dept. of Materials Science and Engineering, School of Engineering and Applied Science, University of Virginia, Charlottesville, USA, 6 October 2003.

### **INVITED TALKS NOT GIVEN:**

1. 4th International Symposium on Diamond Materials, with the 187th Meeting of the Electrochemical Society, Inc., Reno, Nevada, USA, 21 - 26 May 1995.
2. 3rd International Conference on the Applications of Diamond Films and Related Materials, NIST, Gaithersburg, MD, USA, 21 - 24 Aug. 1995.
3. Symposium on "Diamond for Electronic Applications", Fall 1995 meeting of the Materials Research Society, Boston, MA, USA, 27 Nov. - 1 Dec. 1995.
4. Taiwan International Diamond and Related Materials Science & Technology Symposium, Taipei, Taiwan 30 July – 2 August 2000.

### **BOOKS**

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