

## I – Original Contributions – Innovations

1. A. Karoui, Discovery of an oxynitride crystalline shallow layer grown by annealing of nitrogen doped silicon.
2. A. Karoui, Development of a nanoscale carrier lifetime measurement technique ( $\tau$ -NSOM) by Near Field Optical Microscopy and nanoscale analysis of stresses ( $\epsilon$ -NSOM).
3. A. Karoui, and student S. Wyne, Injection Level Spectroscopy of defects in high purity semiconductors by microwave Photoconductance Decay
4. A. Karoui, Surface passivation for minority carrier recombination lifetime measurement.
5. A. Karoui, Novel technique named “Drift Induced impurity Gettering”, impurities are driven out of device zone of a silicon wafers by an external field,...
6. A. Karoui, Double gettering for solar cells,
7. A. Karoui, Multifunction layers in solar cell technology.
8. F. Sahtout Karoui, A. Karoui, SPECKLE<sup>1</sup> Simulator for defects formation in semiconductors, NCSU, 1999.
9. F. Sahtout Karoui, A. Karoui, Simulator of charge carrier recombination in semiconductors by electron beam induced current (EBIC) using Monte Carlo and Green’s Function, NCSU, 1996.
10. A. Karoui, Simulator of spectroscopic optical properties of textured surfaces by ‘Light Interferences’ coupled with ‘Ray Tracing’ (REFLEXIT<sup>2</sup>), INIRST,<sup>3</sup> 1989-1994.
11. A. Karoui, and student M. Bouaicha, CSLM<sup>4</sup> simulator of Confocales Scanning Laser Microscopy images, FST<sup>5</sup> 1994.
12. A. Karoui, and two groups of students ARCHSOLAR, a simulator of solar energy capture and thermal exchanges in modern habitates, INIRST, 1992.
13. A. Karoui, F. Sahtout Karoui, Simulator of minority carrier transient distribution generated by a pulsed laser excitation of semiconductors (P-ROXIT) , IMEC, 1985.

## II – Patents

1. A. Karoui, F. Sahtout Karoui, G. A. Rozgonyi, T. Homma, **Directed self-organized nanoscale for quantum structures via stress risers on silicon on insulators substrate**, filed on Dec. 15, 2004.
2. A. Karoui, F. Sahtout Karoui, G. A. Rozgonyi, **Generation of Gradual Thin Oxynitride Layers at Near-Surface and Hetero-structure Interfaces of Nitrogen Doped Silicon Wafers by Pure Mechanical or Thermo-Mechanical Stresses for Electronic and Photovoltaic Technologies.** (Pending)
3. N. Stoddard, A. Karoui, G. Dusher, G. A. Rozgonyi, **Ion Beam synthesis of oxynitride** (Pending)
4. A. Karoui, G.A.Rozgonyi, **Buried P-N junction-on-nanovoid walls design and application to solar cells and optoelectronic devices** (Pending)
5. A. Karoui, G. A. Rozgonyi, **Photovoltaic Polymer Fabric (PV-PF)** (Pending)

Novel process for fabrication of a simultaneous External Getter and Light Trap in N-Cz Si (Not yet disclosed).

## III – Publications

### A. Journal Papers Recently Submitted/To Submit:

1. F. Sahtout Karoui, A. Karoui, N. Inoue, G. A. Rozgonyi, **Infra-Red Absorption of Nitrogen-Oxygen Defects in Silicon Using Density Functional Theory**, Submitted to Phys. Rev. B
2. Ki-Man Bae, A. Karoui, and G. Rozgonyi, **A Vacancy/Oxygen Based Model Describing the Nucleation and Radial Distribution of Voids, Precipitates, and Stacking Faults in Czochralski Silicon**, Submitted to Electrochem. and Solid State Lett.

<sup>1</sup> SPECKLE: Stochastic Simulator of Point Defect Clustering by Fokker-Planck Equations

<sup>2</sup> REFLEXIT : Diffuse and Specular REFLEctances of teXTured surfaces by Interferences and ray Tracing

<sup>3</sup> INIRST: Institut National de Recherche Scientifique et Technique, Borj Cedria, Tunisie

<sup>4</sup> CSLM: Confocal Laser Scanning Microscopy

<sup>5</sup> FST: Faculté des Sciences de Tunis, University des Sciences de Tunis (actuellement: Université de Tunis El Manar)

3. A. Karoui, **Stress Induced Lifetime Variations In Rapid Thermal Processed Silicon Wafers**, Submitted to Semicond. Sci and Technol.

**B. Invited Talks:**

4. F. Sahtout Karoui, A. Karoui, G. A. Rozgonyi, **Dynamic and Non-Linear Finite Element Modeling of Strain Relaxation Mechanism and Strain Thermal Stability in Strained-Si/SiGe/Si(001) Heterostructure for Nanoscale MOSFET Devices**. Twelfth International Conference on Composites/Nano Engineering (ICCE - 12), Aug. 1-6, 2005, Tenerife, Spain
5. A. Karoui, G. A. Rozgonyi, **Stress Induced Lifetime Variations In Rapid Thermal Processed Silicon Wafers**, DOE Solar Program Review Meeting, Denver, Oct.25-28, 2004.
6. A. Karoui, F. Sahtout Karoui, **Molecular Mechanics and Continuum Elasticity Theory Calculations of Dislocation Locking by Impurities in Silicon and Correlation with Mechanical Properties by Nanoindentation**, Eleventh International Conference On Composites/Nano Engineering (ICCE-11), Aug.8-14, 2004, Hilton-Head, SC.
7. F. Sahtout Karoui, A. Karoui, G. A. Rozgonyi, **Nonlinear, Transient Finite Element Analysis of the Elastic and Plastic Strain-Stress in Epitaxially Grown Strained-Silicon on Relaxed Si<sub>1-x</sub>Ge<sub>x</sub> Buffer**, Eleventh International Conference On Composites/Nano Engineering (ICCE-11), Aug.8-14, 2004, Hilton-Head, SC.

**C. Journal Papers:**

8. A. Karoui, T. Buonassisi, F. Sahtout Karoui, G. A. Rozgonyi, M. Martin, E. R. Weber, **Nitrogen and Oxygen Segregation and Complexing Investigated by High Resolution Synchrotron Fourier Transform Infra Red**, will appear in Physica Status Solidi (a)
9. A. Karoui, **Molecular Mechanics and Continuum Elasticity Theory Calculations of Dislocation Locking by Impurities in Silicon and Correlation with Mechanical Properties by Nanoindentation**, will appear in Journal of Nanotechnology.
10. F. Sahtout Karoui, A. Karoui, G. A. Rozgonyi, **Nonlinear, Transient Finite Element Analysis of the Elastic and Plastic Strain-Stress in Epitaxially Grown Strained-Silicon on Relaxed Si<sub>1-x</sub>Ge<sub>x</sub> Buffer**. will appear in Journal of Nanotechnology.
11. A. Karoui, **Nano-Scale Analysis of Oxygen Precipitation and Interstitial Condensation in Nitrogen-Doped Czochralski Silicon**, will appear in Materials and Engineering: B
12. A. Karoui, **Molecular Mechanics and Continuum Elasticity Theory Calculations of Dislocation Locking by Impurities in Silicon and Correlation with Mechanical Properties by Nanoindentation**, will appear in Materials and Engineering: B
13. N. Stoddard, G. Dusher, A. Karoui, F. Stevie, G. Rozgonyi, **Segregation and Enhanced Diffusion of Nitrogen in Silicon Induced by Low Energy Ion Bombardment**, J. Appl. Phys. **97**, 83534 (2005).
14. A. Karoui, F. Sahtout Karoui, G. A. Rozgonyi, and D. Yang, **Oxygen Precipitation in Nitrogen Doped Czochralski Silicon Wafers. I: Formation Mechanisms of Near-Surface and Bulk Defects**, J. Appl. Phys., **96**(6), 3255 (2004).
15. A. Karoui, and G. A. Rozgonyi, **Oxygen Precipitation in Nitrogen Doped Czochralski Silicon Wafers. II: Effects of Nitrogen and Oxygen Coupling**, J. Appl. Phys., **96**(6), 3264 (2004).
16. E. E. van Dyk, A. Karoui, A. H. La Rosa, G. Rozgonyi, **Near-Field Scanning Optical Microscopy for Characterization of Photovoltaic Materials**, Phys. Stat. Sol. (c) **1**(9), 2292 (2004).
17. A. Kvit, A. Karoui, G. Duscher, and G. A. Rozgonyi, **Umbrella-like Precipitates in Nitrogen-Doped CZ Silicon Wafers**, Appl. Phys. Lett. **84**(11), 1889 (2004).
18. F. Sahtout Karoui, A. Karoui, G. A. Rozgonyi, M. Hourai, and K. Sueoka, **Characterization of Nucleation Sites in Nitrogen Doped Czochralski Silicon by Density Functional Theory and Molecular Mechanics**, Solid State Phenomena, Vols. 95-96, p. 99 (2004).
19. A. Karoui, F. Sahtout Karoui, G. A. Rozgonyi, M. Hourai, and K. Sueoka, **Structure, Energetics and Thermal Stability of Nitrogen-Vacancy Related Defects in Nitrogen Doped Silicon**, J. Electrochem. Soc., **150** (12), G771-777 (2003).

20. N. Stoddard, A. Karoui, G. Duscher, A. Kvit, and G. Rozgonyi **In-Situ Point Defect Generation and Agglomeration during Electron-Beam Irradiation of Nitrogen-Doped Czochralski Silicon**, *Electrochem. and Solid-State Lett.* , **6**(11) pp. G134-G136 (2003).
21. G. A. Rozgonyi, A. Karoui, G. Duscher, and A. Kvit, **Nano-scale analysis of precipitates in nitrogen-doped Czochralski silicon**, *Microelectronic Engineering* **66**(1-4), 305-313 (2003).
22. N. Stoddard, A. Karoui, G. Duscher, A. Kvit, and G. Rozgonyi, **In-Situ Observations of Point Defect Generation and Complexing During Electron Beam Irradiation of Nitrogen Doped Czochralski Silicon**, PV 2002-20 High Purity Silicon VII -- C. L. Claeys, M. Watanabe, P. Rai-Choudhury, and P. Stallhofer; Salt Lake city, p. 347 (2002).
23. S. N. Yoganand, K. Jagannadham, A. Karoui, H. Wang, **Integrated AlN/diamond heat spreaders for silicon device processing**, *J. of Vacuum-Science & Technology A, Vacuum, Surfaces, and Films*, **20**(6), 1974 (2002).
24. S. N. Yoganand, M. S. Raghuvver, K. Jagannadham, L. Wu, A. Karoui, and G. A. Rozgonyi **Multilayer TiCoTiN diffusion barrier films for copper**, *Appl. Phys. Lett.* **80**(1), 79 (2002)
25. D. Funao, I. Ohkubo, N. Inoue, A. Karoui, F. Sahtout Karoui, and G. A. Rozgonyi, **Theoretical Analysis of Nitrogen Complexes in Cz Silicon**, PV 2002-20 High Purity Silicon VII -- C. L. Claeys, M. Watanabe, P. Rai-Choudhury, and P. Stallhofer; (Salt Lake city) p. 133, Fall 2002
26. A. Karoui, F. Sahtout Karoui, G. A. Rozgonyi, M. Hourai, and K. Sueoka, **First Principle Calculations for Nitrogen-Vacancy Related Defects in Nitrogen Doped Silicon: Structure, Energetic and Thermal Stability**, *Semiconductor Silicon 2002, Vol. 2*, Ed. H. Huff et al, p. 670.
27. A. Karoui, F. Sahtout Karoui, A. Kvit, G. A. Rozgonyi, and D. Yang, **Role of nitrogen related complexes in the formation of defects in silicon**, *Appl. Phys. Lett.* , **80**(12), 2114 (2002).
28. A. Karoui, F. Sahtout Karoui and G. A. Rozgonyi **Nitrogen Related Complexes and Extended Defect Formation in N-CZ Silicon Wafers**, *Solid State Phenomena*, **74**, 30 (2000).
29. M. Bouaicha, A. Karoui, R. Bennaceur, **Effect of Band Gap Narrowing in Solar Grade Silicon Grain Boundaries on the Recombination Velocity Obtained from Light-Beam-Induced-Current**, 3th WSEAS CSCC (WSEAS International Multiconference on Circuits, Systems, Communications and Computers), Athens, Greece, July 4-9, 1999.
30. M. Bouaicha; A. Karoui; R. Bennaceur, **Consideration of band bending and reduced optical transmittance at grain boundaries in LBIC analysis**, *Physica-Status-Solidi-A.* , **175**(2), 561-7, (1999).
31. A. Romanowski, A. Buczkowski, A. Karoui and G. A. Rozgonyi, **Frequency-resolved microwave reflection photoconductance**, *J. Appl. Phys.* , **83**, 12, 7730 (1998).
32. A. Karoui, Q. Zhang, A. Romanowski, G. A. Rozgonyi P. Rushbrook, and Jean F. Daviet, **Recombination Lifetime Variations and Defect Introduction by Rapid Thermal Processing**, in *Silicon Recombination Lifetime Characterization Methods*, ASTM STP 1340, F. Bacher and W. H. Hughes Eds. , p. 250, (1998).
33. A. Romanowski, A. Buczkowski, A. Karoui, G. A. Rozgonyi, **Contactless Frequency Resolved Photo-Conductance (FR-PC) Measurement of Iron Contaminated P-Type Silicon**, in *Silicon Recombination Lifetime Characterization Methods*, ASTM STP 1340, F. Bacher and W. H. Hughes Eds. , p. 68. (1998).
34. G. Marrakchi, K. Charkaoui, A. Karoui, G. Hirt, and G. Muller, **Traps in undoped semi-insulating InP obtained by high temperature annealing**, *J. Appl. Phys.* **79**(9) 6947 (1996).

#### **D. International Conferences with Review:**

35. A. Karoui, J. Peters, Y. K. Park, G. A. Rozgonyi, K. M. Youssef, S. Narayanan, **Correlation of Thin Silicon Polycrystalline Wafers Breakage with Impurity Distribution by MicroPCD Mapping**, XIth GADEST Conference, Giens (France), 25-30 September 2005.
36. F. Sahtout Karoui, A. Karoui, G. A. Rozgonyi, **Thermal Stability of Strain in Strained-Si on Si<sub>1-x</sub>Ge<sub>x</sub>/Si Using Transient Nonlinear Finite Element Analysis**, XIth GADEST Conference, Giens (France), 25-30 September 2005.
37. F. Sahtout Karoui, A. Karoui, G. Rozgonyi , **Nonlinear Transient Finite Element Analysis of the Relaxation Mechanisms in Strained Silicon Grown on SiGe Virtual Substrate**, Symposium O: Thin Films -- Stresses and Mechanical Properties XI, MRS Spring Meeting, San Francisco, March 28 – Apr 1, 2005.

38. G. Duscher, A. Kvit, Donovan Leonard, A. Karoui, and Nathan G. Stoddard, **New Additions to the Menagerie of Defects in Silicon**, Symposium E, Semiconductor Defect Engineering, Materials -- Synthetic Structures, and Device, MRS Spring Meeting, San Francisco, March 28 – Apr 1, 2005.
39. A. Karoui, T. Buonassisi, M. Martin, F. Sahtout Karoui, G. A. Rozgonyi, E. R. Weber, **Stress-Induced Nitrogen and Oxygen Segregation and Complex formation by High Resolution Synchrotron FTIR**, Advanced Light Source Meeting, Berkeley, CA, Oct.18-20, 2004.
40. A. Karoui, G.A.Rozgonyi, **Effect of Grown-in Light Element Impurities on PV Silicon**, DOE Solar Program Review Meeting, Denver, Oct.25-28, 2004.
41. A. Karoui, T. Buonassisi, F. Sahtout Karoui, G. A. Rozgonyi, M. Martin, E. R. Weber, T. Ciszek, **Stress-Induced Nitrogen and Oxygen Segregation and Complexing Investigated by High Resolution Synchrotron FTIR**, 14<sup>th</sup> Workshop On Crystalline Silicon Solar Cell, Materials and Processes, National Renewable Energy Laboratory, Aug. 10-13, 2004, Winter Park, CO, USA, pp. 77 (2004).
42. A. Karoui, G. A. Rozgonyi, **Molecular Mechanics and Continuum Elasticity Theory Calculations of Dislocation Locking by Impurities in Silicon and Correlation with Mechanical Properties by Nanoindentation**, 14<sup>th</sup> Workshop On Crystalline Silicon Solar Cell, Materials and Processes, National Renewable Energy Laboratory, Aug. 10-13, 2004, Winter Park, CO, USA, pp. 127 (2004).
43. J. Peters, A. Karoui, Y.K. Park, G. Rozgonyi, M. Narayanan, **Impurity and Mechanical Characterization of Block Cast Silicon**, 14<sup>th</sup> Workshop On Crystalline Silicon Solar Cell, Materials and Processes, National Renewable Energy Laboratory, Aug. 10-13, 2004, Winter Park, CO, USA, (2004).
44. A. Karoui, **Atomistic Modeling of Impurity Atmospheres in Silicon and Dislocation Locking Effects**, in *Silicon Front-End Junction Formation-Physics and Technology*, Eds. P. Pichler, A. Claverie, R. Lindsay, R. Orłowski, W. Windl, Mat. Res. Soc. Symp. Proc. Vol. **810**, C8.19, (2004).
45. F. Sahtout Karoui, A. Karoui, G. A. Rozgonyi, **Finite Element Analysis of Elastic and Plastic Deformation During Growth of Si<sub>1-x</sub>Ge<sub>x</sub> Heterostructures**, in *Nanoscale Materials and Modeling Relations Among Processing Microstructure, and Mechanical Properties* Eds. P. M. Anderson, T. Foecke, A. Misra, R. E. Rudd, Mat. Res. Soc. Symp. Proc. Vol. **821**, P3.39 (2004).
46. F. Sahtout Karoui, A. Karoui, G. A. Rozgonyi, **Vibrational Spectra of Nitrogen-Oxygen Defects in Nitrogen Doped Silicon Using Density Functional Theory** in *Silicon Front-End Junction Formation-Physics and Technology*, Eds. P. Pichler, A. Claverie, R. Lindsay, R. Orłowski, W. Windl, Mat. Res. Soc. Symp. Proc. Vol. **810**, C8.18 (2004).
47. A. Karoui, G. A. Rozgonyi, Ted Ciszek, **Effect of Oxygen and Nitrogen Doping on Mechanical Properties of Silicon Using Nano-Indentation**, in *Nanoscale Materials and Modeling Relations Among Processing Microstructure, and Mechanical Properties* Eds. P. M. Anderson, T. Foecke, A. Misra, R. E. Rudd, Mat. Res. Soc. Symp. Proc. Vol. **821**, P8.36 (2004).
48. A. Karoui, F. Sahtout Karoui, George A Rozgonyi, **Molecular Dynamics and First-Principles Calculations of Defect Precursors Formation in N doped Silicon**, MRS Spring Meeting 2004, Symposium Q: Nucleation Phenomena—Mechanisms, Dynamics, and Structure.
49. N. Inoue, D. Funao, I. Ohkubo, A Natsume, F. Sahtout Karoui, A. Karoui, and G. A. Rozgonyi, **Analysis on reaction process of nitrogen complexes in CZ silicon**, in *Proceedings of the Forum on the Science and Technology of Silicon Materials 2003*, Eds. H. Yamada-Kaneta, and K. Sumino, Shonan Village Center, Kanagawa, Japan, Nov. 25-27, 2003, p.242-246.
50. N. Inoue, D. Funao, I. Ohkubo, A Natsume, F. Sahtout Karoui, A. Karoui, and G. A. Rozgonyi, **Analysis on Reaction Process of Nitrogen Complexes in CZ Silicon**, DRIP X, 10th International Conference on Defects: Recognition, Imaging and Physics of Semiconductors in Batz-sur-Mer, France, Sep. 29 - Oct. 2, 2003.
51. A. Karoui, F. Sahtout Karoui, G. A. Rozgonyi, **First-Principles Calculations of Nucleation Precursors in Nitrogen-doped Silicon**, 13<sup>th</sup> Workshop On Crystalline Silicon Solar Cell, Materials and Processes, National Renewable Energy Laboratory, Aug. 10-13, 2003, Vail, CO, USA pp. 77 (2003).
52. A. Karoui, G. A. Rozgonyi, **Modeling and Simulation of Dislocation Atmosphere Locking Effects in Silicon**, 13<sup>th</sup> Workshop On Crystalline Silicon Solar Cell, Materials and Processes, National Renewable Energy Laboratory, Aug. 10-13, 2003, Vail, CO, USA, pp. 81 (2003).
53. A. Karoui, G. A. Rozgonyi, **Optimization of Silicon Crystal Growth and Wafer Processing for High Efficiency and High Mechanical Yield**, Project Review, Project: AAT-2-31605-05, 13<sup>th</sup> Workshop On

- Crystalline Silicon Solar Cell, Materials and Processes, National Renewable Energy Laboratory, Aug. 10-13, 2003, Vail, CO, USA.
54. F. Sahtout Karoui, A. Karoui, G. A. Rozgonyi, N. Inoue, H. Harada, **Ab-initio Calculations of Infra-Red Absorption in N Doped Czochralski Silicon**, Extended Abstract No 356, Electrochem. Soc. Meeting, Philadelphia, May 12-17, 2002.
  55. A. Karoui, F. Sahtout Karoui, G. A. Rozgonyi, M. Hourai, and K. Sueoka, **First Principles Calculations for Nitrogen-Vacancy Related Defects in N-CZ Si**, Extended Abstract No 604 Electrochem. Soc. Meeting, Philadelphia, May 12-17, 2002.
  56. A. Karoui, R. Zhang, G. A. Rozgonyi, and, T. Ciszek, **Silicon Crystal Growth and Wafer Processing for High Efficiency Solar Cells and High Mechanical Yield**, in Proceedings of NCPV, NREL/CP-520-31057, Lakewood, CO, 14-17 Oct. 2001.
  57. G. A. Rozgonyi, A. Karoui, L. Kordas and T. Ciszek, **Optimization of Silicon Crystal Growth and Wafer Processing for High Efficiency and High Mechanical Yield**, 11<sup>th</sup> Workshop on Crystalline Silicon Solar Cell Materials and Processes, Ed. B. L. Sopori, NREL Aug. 19-22, 2001.
  58. F. Sahtout Karoui, A. Karoui, and G. A. Rozgonyi, **Simulation of Point Defect Clustering in CZ-Silicon Wafers On The Cray T3E Scalable Parallel Computer: Application to Oxygen Precipitation**, MSM2000, San Diego, March 27-29, p. 98, (2000).
  59. G. A. Rozgonyi, F. Sahtout Karoui, A. Karoui, **Computer Simulation of Oxygen Precipitation in CZ Silicon Wafers**, ECS Proc. Vol. 99, Hawaii, Oct. 1999.
  60. A. Romanowski, A. Karoui, E. Covalla, and G. Rozgonyi **Contactless Characterization of Silicon Using Variable Injection Level Frequency Resolved microwave Photoconductance**, AIP Conference Proceedings -- March 5, 1999 – Vol. 462, Issue 1 pp. 424-429.
  61. A. Karoui, Q. Zhang, A. Romanowski, G. A. Rozgonyi P. Rushbrook, and Jean F. Daviet, **Dislocation Control on Silicon Wafers in a Susceptor Based Rapid Thermal Processing Tool**. *6th International Conference on Advanced Thermal Processing of Semiconductors*, RTP'98, Kyoto, Japan Sep. 9-11, 1998.
  62. A. Karoui, Q. Zhang, A. Romanowski, G. A. Rozgonyi, P. Rushbrook, and Jean F. Daviet, **Damage Control Study on Silicon Wafers after Rapid Thermal Processing in a Lamp-Free Environment**, *5<sup>th</sup> International Conference on Advanced Thermal Processing of Semiconductors*, New Orleans Sep 3-5, 1997.
  63. A. Romanowski, A. Karoui, G. A. Rozgonyi, **Emission and Capture Trapping Lifetimes in n-type Silicon Wafers évaluated using Frequency Resolved Microwave Photoconductance (FR-PC)**, Proceedings of the 8<sup>th</sup> workshop on crystalline silicon solar cell materials and processes, Copper Mountain, National Renewable Energy Laboratory, Golden, CO. Aug. 17-19, 1998.
  64. A. Karoui, A. Romanowski, Zhang, G. A. Rozgonyi, **Double Gettering and Multifunctional Layers for Solar Cell Technology**, Proceedings of the 8<sup>th</sup> workshop on crystalline silicon solar cell materials and processes, Copper Mountain, National Renewable Energy Laboratory, Golden, CO. Aug. 17-19, 1998.
  65. K. Bae, A. Karoui, G. A. Rozgonyi, **OSF ring and D-defect Formation Mechanism in Czochralski-Grown Si crystalsBased on Vacancy-Oxygen Interactive Precipitation Process** – Extended Abstract No 376, ECS Vol. 97-1, Montreal, May '97.
  66. A. Sellami, A. Karoui, H. Ezzaouia, **Parameter Identification for a Constitutive Law Describing Deformation Induced Anisotropy**, Vol. V: Systems Engineering, pp. 749. IMACS 1997.
  67. A. Karoui, A. Romanowski, Q. Zhang, **Double Gettering of Solar Grade Silicon Materials Using Aluminum And Titanium** - *6<sup>th</sup> Workshop on the role of impurities and defects in silicon device processing*, National Renewable Energy Laboratory, Snowmass, Co, Aug. 12-14, 1996.
  68. A. Romanowski, A. Karoui, G. A. Rozgonyi, **Contactless Frequency Resolved Microwave Spectroscopy Of The P-Si In The Presence Of Carrier Trapping** - *6<sup>th</sup> Workshop on the role of impurities and defects in silicon device processing*, National Renewable Energy Laboratory, Snowmass, Co, Aug. 12-14, 1996.
  69. A. Karoui, F. Sahtout Karoui, Z. J. Radzjinski, and G. A. Rozgonyi, **Monte Carlo Simulation of Defect Recombination Activity in Electron Beam Induced Current**, *Proceedings of Scanning Microscopy 1996 Meeting*, May 11-16, Bethesda, Maryland.
  70. K. Cherkaoui, S. Kallel, G. Marrakchi, A. Karoui, **Comparative Study of the Defects In Fe-Doped or Undoped Semi-Insulating InP after High Temperature Annealing**, Proceedings of IEEE Semicond. Semi Insul. Mater. Conf Simc. , IEEE, Piscataway, NJ, (USA), 1996, p. 59-62.

71. Z. J. Radzinski, A. Romanowski, N. Noudjina, A. Karoui, and G. A. Rozgonyi, **Electrical and Structural Aspects of Gettering using MeV Si Implantation into Czochralski Silicon** – Extended Abstract, Electrochem. Soc. Meeting, Los Angeles, May '96.
72. H. Ezzaouia, B. Bessais, A. Karoui, M. F. Boujmil, R. Bennaceur, **Amélioration à 14 % du Rendement des Cellules PV ( $\phi= 4$  inches) à Base de Silicium Monocristallin Produites dans l'Unité Pilote de l'INRST en Tunisie**. 4ème Journées Maghrébines des Sciences des Matériaux Casablanca 23-24 Novembre 1994.
73. A. Karoui, M. Bouaicha, R. Bennaceur, **Improvement of the LBIC Technique Suited for Textured Solar Cells Characterization** - First International Symposium on Semiconductor processing and characterization with lasers ( Stuttgart 18 April 1994 ).
74. A. Karoui, H. Ezzaouia, B. Bessais, R. Bennaceur, M. Maalej, **The Tunisian Experience in Solar Cell Fabrication and Photovoltaic Applications**. 12<sup>th</sup> European Photovoltaic Solar Energy Conference and Exhibition, Amsterdam, April 1, 1994.
75. A. Karoui, M. Bouaicha, R. Bennaceur, **Object Retrieving from Confocal Microscopy Images: Application to textured Polycrystalline Silicon**- SPIE, Vol.2241, Inverse Optics III, Orlando, p.151 (1994).
76. A. Karoui, M. Bouaicha, R. Bennaceur, **Simulation d'Images Tridimensionnelles par Microscopie Confocale à Balayage Laser des Textures du Silicium Polycristallin** - 4<sup>ème</sup> Colloque Maghrébin sur les Modèles Numériques de l'Ingénieur, Alger, Nov. 22-25, 1993.
77. M. F. Boujmil, A. Karoui, H. Ezzaouia, R. Bennaceur, **Effects of Surface Treatment and Anti Reflecting Coating on The Efficiency of Monocrystalline and Polycrystalline Silicon Solar Cells**, 11th European Photovoltaic Solar Energy Conference and Exhibition, Montreux, 12 Apr. 1991.
78. B. Bessais, A. Karoui, B. Rezig, **Electro-Optical Performances and Conduction Models of Screen Printed and Sprayed ITO Thin Films: A Comparative Study**, World Renewable Energy Congress, Reading, Sep. 1990.
79. A. Karoui, F. Karoui, Q. Zhaoming, R. Bennaceur, R. Mertens, **Laser Beam and Crystal Defect Interactions - World Renewable Energy Congress**, Reading, Sep. 1990.
80. A. Karoui, F. Karoui, Q. Zhaoming, R. Bennaceur, R. Mertens, **Study of the Surface of Textured Polycrystalline Cells by Reflectance Measurements**, World Renewable Energy Congress, Reading, Sep. 1990.
81. A. Karoui, **Results achieved in the framework of the Tunisian Photovoltaic Program**, Workshop of Material Science and non Conventional Energy Sources, Trieste, Sep. 1989.
82. A. Karoui, Q. Zhaoming, F. Karoui, R. Bennaceur, R. Mertens, **Studies of Surface Optical and Electrical Properties of Screen Printed Solar Cells by Reflectivity Coupled to Light Beam Induced Current (RC LBIC)**, 2ème Ecole d'Etude des Surfaces, Oran, Dec. 1988.
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<sup>10</sup> SERST : Secretariat à la Recherche Scientifique et à la Technologie

<sup>11</sup> ENSET : Ecole Normale Supérieure de l'Enseignement Technique, University des Sciences de Tunis