

# Tomoyuki Nishita

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## Date and Place of Birth

January 4, 1949 Hiroshima, Japan

## Degrees

BE in Electrical Engineering, Hiroshima University, Japan, 1971

ME in Electrical Engineering, Hiroshima University, Japan, 1973

PhD in Engineering, Hiroshima University, Japan, 1985

## Working Experience

**1973** Research Associate of Department of Advanced Development, Mazda, Hiroshima, Japan

**1979** Lecturer of Department of Electrical Engineering, Fukuyama University

**1984** Associate Professor of Department of Electrical Engineering, Fukuyama University

**1988-1989** Visiting Professor of Brigham Young University, USA

**1990** Professor of Department of Electrical Engineering, Fukuyama University

**1998** Professor of Department of Information Science, Faculty of Science, The University of Tokyo

**1999** Professor of Department of Complexity Science and Engineering, Graduate School of Frontier Sciences, The University of Tokyo

## Principal Publications

see attached

## Professional Service

1. Papers Committee of **SIGGRAPH**: 1993, 1994, 1999, 2002
2. Program Committee of **EUROGRAPHICS**: 1995
3. Program Committee of **CG International**: 1995, 1996, 1997
4. Program Committee of **Pacific Graphics**: 1993, 1995, 1996, 1997, 1998, 1999, 2002, 2003
5. Program Committee of **CAD/Graphics**: 1995, 1997, 1999
6. Editorial Board of **IEEE Transaction on Visualization and Computer Graphics**: 1994–1998
7. Vice-chair of **ACM SIGGRAPH-Tokyo**: 1997-
8. Editorial board of **Journal of Information Science and Engineering**: 1999-
9. Editorial board of **the Visual Computer Journal**: 2000-
10. Chair of **Visual Computing Committee**: 2001-
11. Vice Chair of **IEEE of Japan**: 2001-
12. Program co-chair of **CAD/Graphics**: 2001
13. Organizer & Program Committee of **Pacific Graphics**: 2001
14. Program Committee of **International Symposium Cyber Worlds**: 2002
15. Program co-chair of **CG International**: 2003
16. Program Committee of **VG**: 2003

## Honors and Awards

- Research Award on Computer Graphics from Information Processing Society of Japan in 1987
- Best Paper Award from EUROGRAPHICS in 1995
- Paper Award from The Institute of Image Electronics Engineers of Japan in 1996
- Best Paper Award from NICOGRAPH in 1999
- Best Educational Material Award from Information Processing Society of Japan in 2002

## Invited Talks/Tutorial

1. SIGGRAPH 93 (Anahim, USA) :Tutorial Course
2. PacificGraphics 94 (Korea) :Tutorial Course
3. ASIA DISPLAY 95 (Hamamatu, Japan)
4. CAD Graphics95 (China)
5. PacificGraphics96 (Taiwan)
6. SCCG98 (Slovakia)

7. EUROGRAPHICS Workshop on Rendering98 (Austria)
8. ICS'98 CG & VR (Taiwan), "Application of Metaballs "
9. Pacific Graphics99 (Soul), "Display methods of clouds "
10. CGInternational2001 (HongKong), "Display methods of Natural Phenomena "

## Research Interests

Computer Graphics involving lighting model (radiosity, extended light sources, light scattering), hidden-surface removal, anti-aliasing, image composition, geometric modeling, realistic rendering of natural phenomena, and Web Graphics.

# Publications

## 1 ACM SIGGRAPH Papers

1. T.Nishita, E.Nakamae, “Continuous Tone Representation of Three-Dimensional Objects Taking Account of Shadows and Interreflection,” *Computer Graphics*, Vol.19, No.3, 1985-7, pp.23–30.
2. T.Nishita, E.Nakamae, “Continuous Tone Representation of Three-Dimensional Objects Illuminated by Sky Light,” *Computer Graphics*, Vol.20, No.3, 1986-8, pp.125–132.
3. E.Nakamae, Harada, Ishizaki, T.Nishita, “Montage: The Overlaying of the Computer Generated Image onto a Background Photograph,” *Computer Graphics*, Vol.20, No.3, 1986-8, pp.207–214.
4. T.Nishita, E.Nakamae, “A Shading Model for Atmosphere Scattering Considering Luminous Intensity Distribution of Light Sources,” *Computer Graphics*, Vol.21, No.3, 1987-7, pp.303–310.
5. K.Kaneda, F.Kato, E.Nakamae, T.Nishita, Tanaka, Noguchi, “Three-Dimensional Terrain Modeling and Display for Environmental Assessment,” *Computer Graphics*, Vol.23, No.23, No.3, 1989-8, pp.207–214.
6. E.Nakanmae, K.Kaneda, T.Okamoto, T.Nishita, “A Lighting Model Aiming at Drive Simulators,” *Computer Graphics*, Vol.24, No.4, 1990-8, pp.395–404.
7. T.Nishita, T.Sederberg, M.Kakimoto, “Ray Tracing Trimmed Rational Surface Patches,” *Computer Graphics*, Vol.24 No.4, 1990-8, pp.337–345.
8. T.Nishita, T.Shirai, K.Tadamura, E.Nakamae, “Display of The Earth Taking into account Atmospheric Scattering,” *Computer Graphics*, Vol.27, No.4, 1993-8, pp.175–182.
9. T.Nishita, E.Nakamae, “Method of Displaying Optical Effects within Water using Accumulation-Buffer,” *Proc. of SIGGRAPH’94*, 1994-7, pp.373–380.
10. T.Nishita, Y.Dobashi, E.Nakamae, “Display of Clouds Taking into Account Multiple Anisotropic Scattering and Sky Light,” *Proc. of SIGGRAPH’96*, 1996-8, pp.379–386.
11. Y. Dobashi, K. Kaneda, H. Yamashita, T. Okita, T. Nishita “A Simple, Efficient Method for Realistic Animation of Clouds,” *Proc. of SIGGRAPH’2000*, 2000-7, pp.19-28
12. Y. Dobashi, T. Yamamoto, T. Nishita, ”Real-time Rendering of Aerodynamic Sound using Sound Textures based on Computational Fluid Dynamics,” *Proc. of SIGGRAPH’2003*, 2003-7

## 2 EUROGRAPHICS Papers (Computer Graphics Forum)

1. E.Nakamae, H.Yamashita, K.Harada, T.Nishita, “Computer Graphics for Visualizing Simulation Results,” *EUROGRAPHICS’84*, 1984-9, pp.419–432.
2. K.Tadamura, E.Nakamae, K.Kaneda, M.Baba, H.Yamashita, T.Nishita, “Modeling of Skylight and Rendering of outdoor Scenes,” *Computer Graphics Forum*, Vol.12, No.3, 1993, pp.189–201.
3. T.Nishita, E.Nakamae, “A New Radiosity Approach Using Area Sampling for Parametric Patches,” *Computer Graphics Forum*, Vol.12, No.3, 1993, pp.385–393.
4. Y.Dobashi, K.Kaneda, E.Nakashima, H.Yamashita, T.Nishita, K.Tadamura, “Skylight for Interior Design,” *Computer Graphics Forum*, Vol.13, No.3, 1994-9, pp.85–96.
5. T.Nishita, E.Nakamae, “A Method for Displaying Metaballs by using Bezier Clipping,” *Computer Graphics Forum*, Vol.13, No.3, 1994-9, pp.271–280.
6. Y.Dobashi, K.Kaneda, E.Nakashima, H.Yamashita, T.Nishita, “A Quick Rendering Method using Basis Functions for Interactive Lighting Design,” *Computer Graphics Forum*, Vol.14, No.3, 1995-9, pp.229–240.

7. Y.Dobashi, K.Kaneda, H.Yamashita, T.Nishita, "Method for Calculation of Sky Light Luminance Aiming at an Interactive Architectural Design," *Computer Graphics Forum*, Vol.15, No.3, pp.112-118.
8. T.Nishita, H.Iwasaki, Y.Dobashi and E.Nakamae, "A Modeling and Rendering Method for Snow by Using Metaballs," *Computer Graphics Forum*, Vol.16, No.3, 1997-9.
9. K. Iwasaki, Y.Dobashi, T. Nishita, "A Fast Rendering Method for Refractive and Reflective Caustics Due to Water Surfaces," *Computer Graphics Forum*, Vol.23, No.3, 2003-9
10. Y. Bando, B.-Yu Chen, T. Nishita, "Animating Hair with Loosely Connected Particles," *Computer Graphics Forum*, Vol.23, No.3, 2003-9

### 3 Other Papers

1. E. Nakamae, T. Nishita, "An Algorithm for Hidden Line Elimination of Polyhedra," *Information Processing in Japan*, Vol.12, 1972, pp.134-141.
2. T. Nishita, E. Nakamae, "An Algorithm for Half-Toned Representation of Three Dimensional Objects," *Information Processing in Japan*, Vol.14, 1974-1, pp.93-99.
3. T. Nishita, E. Nakamae, "Half-Tone Representation of 3-D Objects Illuminated by Area Sources or Polyhedron Sources," *IEEE Computer Society's 7th International Computer Software & Applications Conference(COMPSAC)*, 1983-11, pp.237-242.
4. T. Nishita, I. Okamura, and E. Nakamae, "Shading Models for Point and Linear Sources," *ACM Transactions on Graphics*, Vol.4, No.2, 1985-4, pp.124-146.
5. E. Nakamae, T. Ishizaki, T. Nishita, S. Takita, "Composition 3D Images with Anti-aliasing and Various Shading Effects," *IEEE Computer Graphics and Applications*, Vol.9, No.2, 1989-3, pp.21-29.
6. E. Nakamae, K. Kaneda, K. Miwa, T. Nishita, Saeki, "Reliability of Computer Graphics Images as Visual Assessment Tool," *CG International'89b(New Advanced in Computer Graphics; Springer-Verlag, 1989, pp.633-647.*
7. T. Nishita, K. Kaneda, E. Nakamae, "High-Quality Rendering of Parametric Surfaces by Using a Robust Scanline Algorithm," *Computer Graphics International 90*, pp.493-506, 1990-6.
8. K. Kaneda, T. Okamoto, E. Nakamae, T. Nishita, "Highly Realistic Visual Simulation of Outdoor Scene under Various Atmospheric Conditions," *Computer Graphics International 90*, pp.117-131, 1990-6.
9. T. Sederberg, T. Nishita, "Curve Intersection using Bezier Clipping," *CAD*, Vol.22, No.9, pp.337-345, 1990-11.
10. T. Sederberg, T. Nishita, "Geometric Hermite Approximation of Surface Patch Intersection Curves," *CAGD*, Vol.8, No.2, pp.97-114, 1991-5.
11. K. Kaneda, G. Yuan, E. Nakamae, T. Nishita, "Photorealistic Visual Simulation of Water Surfaces Taking into account Radiative Transfer", *CG & CAD 91*, pp.25-30, 1991-9.
12. T. Nishita, K. Kaneda, E. Nakamae, "A Scanline Algorithm for Displaying Trimmed Surfaces by using Bezier Clipping," *The Visual Computing*, Vol.7, No.5, pp.269-258, 1991-9.
13. K. Kaneda, T. Okamoto, E. Nakamae, T. Nishita, "Photorealistic Image Synthesis for Outdoor Scenery," *The Visual Computing*, Vol.7, No.5, pp.247-258, 1991-9.
14. T. Nishita, S. Takita, E. Nakamae, "Shading Model of Parallel Cylindrical Light Sources," *Computer Graphics International 92*, pp.429-445, 1992-6.
15. T. Nishita, S. Takita, E. Nakamae, "Hidden Curve Elimination of Trimmed Surfaces Using Bezier Clipping," *Computer Graphics International 92*, pp.595-619, 1992-6.
16. T. Nishita, "Lighting Simulation for Extended Light Sources" *ACM SIGGRAPH '93 Course Notes - Global Illumination*, pp.1-33, 1993.

17. K. Takahashi, K. Kaneda, T. Yamanaka, H. Yamashita, E. Nakamae, T. Nishita, "Lighting Design in Inter-reflective Environments Using Hopfield Neural Networks," 1993-10 Journal of Light & Visual Environment, Vol.17, No.2 pp.9-15.
18. T. Nishita, S. Takita, E. Nakamae, "A Display Algorithm of Brush Strokes using Bezier Functions," Computer Graphics International 93, pp.244-257, 1993-6.
19. T. Nishita, K. Fujii, E. Nakamae, "Metamorphosis using Bezier Clipping," Pacific Graphics 93, pp.162-173, 1993.
20. Y. Dobashi, K. Kaneda, H. Yamashita, T. Nishita, "A Quick Rendering Method for Outdoor Scenes Using Sky Light Luminance Functions Expressed with Basis Functions," The Journal of the Institute of Image Electronics Engineers of Japan, Vol. 24, No. 3, pp. 196-205, 1995 (in japanese, Paper Award)
21. Y. Dobashi, K. Kaneda, H. Yamashita, T. Nishita, "A Fast Display Method of Sky Color using Basis functions", Pacific Graphics 95, pp.194-208, 1995.
22. K. Kaneda, Y. Zuyama, H. Yamashita, T. Nishita, "Animation of Water Droplet Flow on Curved surfaces," Pacific Graphics 96, pp.50-65, 1996-8.
23. T. Nishita, Y. Dobashi, K. Kaneda, H. Yamashita, "Display Method of the Sky Color Taking into Account Multiple Scattering," Pacific Graphics 96, pp.117-132, 1996-8.
24. T. Nishita, "A Display System for Bezier Surfaces and Metaballs using Bezier Clipping," Pacific Graphics 96, pp.66-79, 1996-8
25. Y. Dobashi, K. Kaneda, H. Yamashita, T. Nishita, "A Quick Rendering Method for Outdoor Scenes Using Sky Light Luminance Functions Expressed with Basis Functions," The Journal of Image and Electronics Society of Japan, Vol.24, No.3, 1995, pp.196-205. (in japanese)
26. Y. Dobashi, K. Kaneda, H. Yamashita, T. Nishita, "A Fast Display Method of Sky Color using Basis functions," The Journal of Visualization and Computer Animation, Vol. 8, No. 2, pp.115-127, 1997-4
27. Y. Dobashi, C. Vlatko, K. Kaneda, H. Yamashita, T. Nishita, "A Fast Volume Rendering Method for Time-Varying 3-D Scalar Field Visualization Using Orthonormal Wavelets," IEEE Trans. on Magnetics, Vol. 34, No. 5, 1998, pp. 3431-3434.
28. T. Nishita, "Applications of Bezier Clipping Method and Their Java Applets," SCCG 98, pp.3-15, 1998-4
29. Y. Dobashi, H. Nakatani, K. Kaneda, H. Yamashita, "An Interactive Lighting Design System Integrating Forward and Inverse Approach," The Journal of the Institute of Image Electronics Engineers of Japan, Vol. 27, No. 4, pp. 349-359, 1998 (in japanese)
30. T. Nishita, "Light Scattering models for the Realistic Rendering," EGR 98 (Rendering Techniques 98, Eurographics), Springer-Verlag Wien, pp.1-10, 1998-6
31. Y. Dobashi, T. Nishita, H. Yamashita, T. Okita, "Modeling of Clouds from Satellite Images Using Metaball," Pacific Graphics 98, pp.53-60, 1998-10
32. R. Matsuda, T. Nishita, "Modeling and Deformation Method of Human Body Model Based on Range Data," Shape Modeling International 99, pp.218-219, 1999-3
33. T. Nishita, H. Johan, "A Scan Line Algorithm for Rendering Curved Tubular Objects," Pacific Graphics 99, pp.92-101, 1999-10
34. T. Nishita, Y. Dobashi, "Modeling and Rendering Methods of Clouds," Pacific Graphics 99, pp.218-219, 1999-10
35. Y. Dobashi, T. Nishita, T. Okita, "Animation of Clouds Using Cellular Automation," CGIM 99, 1999-10.
36. Y. Dobashi, T. Nishita, H. Yamashita, T. Okita, "Using metaballs to modeling and animate clouds from satellite images," The Visual Computing, Vol.15, 9, 1999-10, pp.471-482.
37. H. Johan, Y. Koiso, T. Nishita, "A Solution to Vertex Path Problem in Shape Blending by Using a Dependency Graph," SIGGRAPH 2000, Sketches & Applications, pp.259, 2000-7
38. Y. Dobashi, T. Okita, T. Nishita, "Interactive Rendering of Shafts of Light Using a Hardware-Accelerated

- Volume Rendering Technique”, SIGGRAPH 2000 Sketches & Applications, pp.219, 2000-7
39. K. Onoue, T. Nishita, “A Method for Modeling and Rendering Dunes with wind-ripples,” Pacific Graphics 2000, pp.427-430, 2000-10
  40. H. Johan, Y. Koiso, T. Nishita, “Morphing Using Curves and Shape Interpolation Techniques,” Pacific Graphics 2000, pp.348-358, 2000-10
  41. S. Yoshida, T. Nishita, “Modelling of Smoke Flow Taking Obstacles into Account,” Pacific Graphics 2000, pp.135-144, 2000-10
  42. Y. Dobashi, T. Yamamoto, T. Nishita, “Interactive Rendering Method for Displaying Shafts of Light,” Pacific Graphics 2000, pp.31-37, 2000-10
  43. B.-Y. Chen, T. Nishita, “jGL and its Applications as a Web3D Platform,” Web3D 2001, pp.85-91, 2001-2
  44. T. Nishita, Y. Dobashi, “Modeling and Rendering of Various Natural Phenomena Consisting of Particles”, Computer Graphics International 2001, pp.149-156, 2001-7
  45. Y. Dobashi, T. Nishita, T. Yamamoto, “An Accurate, Fast Method Using Graphics Hardware for Rendering Shafts of Light,” The Journal of The Institute of Image Information and Television Engineers, Vol.55, No.7, pp.362-370, 2001-7 (in japanese)
  46. Y. Dobashi, R. Miyazaki, S. Yoshida, T. Nishita, “Modeling of Clouds Using a Coupled Map Lattice,” SIGGRAPH 2001, Sketches & Applications, pp.229, 2001-7
  47. H. Johan, T. Nishita, “2D Shape Interpolation Using A Hierarchical Approach,” SIGGRAPH 2001 Sketches & Applications, pp.143, 2001-7
  48. T. Haga, H. Johan, T. Nishita, “Animation Method for Pen-and-Ink Illustrations Using Stroke Coherency,” CAD & Graphics 2001, pp.333-343, 2001-8
  49. K. Iwasaki, Y. Dobashi, T. Nishita, “Efficient Rendering of Optical Effects within Water using Graphics Hardware, ” Pacific Graphics 2001, pp.374-383, 2001-10
  50. Y. Dobashi, T. Yamamoto, T. Nishita, “Efficient Rendering of Lightning Taking into Account Scattering Effects due to Clouds and Atmospheric Particles,“ Pacific Graphics 2001, pp.390-399, 2001-10
  51. R. Miyazaki, S. Yoshida, Y. Dobashi, T. Nishita, “A Method for Modeling Clouds based on Atmospheric Fluid Dynamics, ” Pacific Graphics 2001, pp.363-372, 2001-10
  52. B.-Y. Chen, T. Nishita, “Multiresolution Streaming Mesh with Shape Preserving and QoS-like Controlling”, Web3D 2002, pp.35-42, 2002-2
  53. B.-Y. Chen, T. Nishita “The Development of 3D Graphics and VRML Libraries for Web3D Platform by Using Java”, J. of IEICE, Vol.J85-D-II, No.6 , pp.1047-1054, 2002
  54. B.-Y. Chen, T. Nishita, “Adaptive Solid Texturing for Web Graphics,” SIGGRAPH 2002 Web Graphics, pp.299, 2002-7
  55. Y. Koiso, K. Amoh, Y. Mochizuki, T. Nishita “Network-based Walk-through System using Relief Textures as Distant View Billboards”, J. of IIEEJ, Vol.31, No.4, pp.468-476, 2002-7 (in Japanese)
  56. Y. Mochizuki, T. Nishita, “Development For WEB-Based CG System And Its Application to Modeling And Animation Systems, 10th ICGG, Vol.2, pp.172-177, 2002-8
  57. T. Nishita, K. Kondo, Y. Ohno, K. Miura, Y. Takai, Y. Dobashi, T. Takahashi, S. Ishiuchi. A. Kimura, A. Miyai, “Development of Web Based Training System and Courseware for Advanced Computer Graphics Courses Enhanced by Interactive Java Applets,” 10th ICGG, Vol.2, pp.123-128, 2002-8
  58. Y. Dobashi, T. Nishita, T. Yamamoto, “Interactive Rendering of Atmospheric Scattering Effects Using Graphics Hardware,” Proc. Graphics Hardware 2002, pp.99-108, 2002-9
  59. Y. Dobashi, T. Haga, H. Johan, T. Nishita, “A Method for Creating Mosaic Images Using Voronoi Diagrams, ” EUROGRAPHICS 2002,Short Presentatipn, pp.341-348. 2002-9
  60. R. Miyazaki, Y. Dobashi, T. Nishita, “Simulation of Cumuliform Clouds Based on Computational Fluid Dy-

- namics,” EUROGRAPHICS 2002, Short Presentatipn, pp.405-410, 2002-9
61. H. Johan, T. Nishita, “Interpolating 2D Shape Hierarchically,” EUROGRAPHICS 2002, Short Presentatipn, pp.87-94, 2002-9
  62. B.-Y. Chen, Y. Ono, H. Johan, M. Ishii, T. Nishita, J. Feng, “3D Model Deformation along a Parametric Surface, ” Visualization, Imaging and Image Processing 2002 (Proc. of the 2nd IASTED International Conference), pp.282-287, 2002-9
  63. B.-Y. Chen, T. Nishita, “Adaptive solid texturing for Web3D applications, ”Pacific Graphics 2002, pp.433-434, 2002-10
  64. Y. Bando, T. Nishita, “A Simple Method for Modeling Wrinkles on Human Skin, ” Proc. Pacific Graphics 2002 (The 10th Pacific Conference on Computer Graphics and Applications), pp.166-175, 2002-10.
  65. Y. Ono, B.-Y. Chen, T. Nishita, J. Feng, ”Free-Form Deformation with Automatically Generated Multiresolution Lattices,” Proc. Cyber Worlds 2002, pp.472-479, 2002-11
  66. P. Kanongchaiyos, T. Nishita, Y. Shinagawa, T. Kunii, “Topological Morphing Using Reeb Graphs,” Cyber Worlds 2002, pp.465-471, 2002-11
  67. K. Iwasaki, Y. Dobashi, T. Nishita, “An Efficient Method for Rendering Underwater Optical Effects Using Graphics Hardware”, Computer Graphics Forum, Vol.21, No.4, pp.701-711, 2002-12
  68. R. Nanba, M. Hasegawa, T. Nishita, K. Aihara, “Optimization using chaotic neural network and its application to lighting design,” Control and Cybernetics, Journal of the Systems Research Institute Polish Academy of Sciences, Vol.31, No.2, pp.249-269, 2002-12
  69. R. Mizuno, Y. Dobashi, T. Nishita, “Volcanic Smoke Animation using CML,” Proc. International Computer Symposium 2002 (ICS2002), Vol. 2, pp.1375-1382, 2002-12.
  70. J. Feng, T. Nishita, X. Jin, Q. Peng, “B-Spline Free-Form Deformation of Polygonal Object as Trimmed Bezier Surfaces”, The Visual Computing, Vol.18, No.8, pp.493-510, 2002-12
  71. K. Onoue, T. Nishita, “A Rendering Method on Desert Scenes of Dunes with Wind-ripples”, J. of IEICE, p.282-289, 2003-2 (in Japanese)
  72. Y. Dobashi, T. Yamamoto, T. Nishita, ”A Radiosity Method for Point-sampled Geometry”, SIGGRAPH 2003 Sketches & Applications, 2003-7
  73. R. Mizuno, Y. Dobashi, B.-Yu Chen, T. Nishita, ”Modeling Volcanic Clouds: a Physical, 3D and Efficient Method”, SIGGRAPH 2003 Sketches & Applications, 2003-7

## Books

1. E. Nakamae, T. Nishita, Three-Dimensional Computer Graphics, Shokodo Pub., Co., 1986 (in Japanese)
2. E. Nakamae, T. Nishita, Lighting Simulation in Computer Graphics, ABLEX Pub., Co., Progress in Computer Graphics, Vol.1, 1991
3. T. Nishita, Image Synthesis using Computers, Daigaku-Kyouiku Pub., Co., 1992 (in Japanese)
4. M. Nakajima, T. Nishita, et al., 3-Dimensional CG, Ohom Pub., Co., 1994 (in Japanese)
5. S. Murakami, S. Akabayashi, T. Nishita, et al., Architectural Environments and Information Visualization, Fikougaku-Tosho, 1995 (in Japanese)
6. M. Nakajima, et al., Standard Textbook on Computer Graphics, CGARTS

and four books