41. (canceled)

42. The three-dimensional image scanner of claim **38**, wherein each of said plurality of pixels of said optical recorder has a planar shape.

43. (canceled)

44. The three-dimensional display of claim **38**, wherein said ultra short optical pulses have a pulse width in the range of femtoseconds to nanoseconds.

45. The three-dimensional display of claim **6**, wherein each of said plurality of non-linear mixer elements is composed from a non-linear optical material chosen from the group consisting of $LiNbO_3$, $LiIO_3$, KH_2PO_4, Tl_3AsSe_3 (TAS), Hg_2Cl_2, KH_2PO_4 (KDP), KD_2PO_4 (DKDP or D*KDP), $NH_4H_2PO_4$ (ADP), Hg_2Br_2 and $BaTiO_3$, quantum well structure semiconductors made of GaAs, etc.; organic single crystals made of 4-nitrobenzylidene-3-acetamino-4-methoxyaniline (MNBA), organic single crystals made of 2-methyl-4-nitroaniline (MNA); conjugated organic high molecular compounds made of polydiacetylene, conjugated organic high molecular compounds made of polyarylene vinylene, semiconductor grain-dispersed glass comprising CdS dispersed in glass, and semiconductor grain-dispersed glass comprising CdSSe dispersed in glass.

46. A method for calibrating a three-dimensional imaging system having optical apparatus for capturing an optical image of a desired object from at least two positions, comprising the steps of:

projecting a virtual calibration pattern in the field of view of the optical apparatus;

choosing one position of the optical apparatus as a reference position;

assigning coordinates of a coordinate system relative to either the virtual calibration pattern or the reference position;

measuring the differences in the virtual calibration pattern from a second position of the optical apparatus;

calculating calibration corrections relative to the reference position based on the spatial locations and orientations in the reference position and the second position; and

adjusting images from the optical apparatus based on the calibration corrections.

47. The method of claim **46** further including the step of assigning the coordinate system at the second position.

48. The method of claim **47**, wherein the optical apparatus includes a single optical recorder that moves between a reference and a displaced position.

49. The method of claim **48**, wherein said single optical recorder is a three-dimensional camera.

50. The method of claim **48**, wherein said single optical recorder is a two-dimensional camera.

51. The method of claim **48**, wherein said single optical recorder includes an electronic imaging detector comprising a pixel array and said step of assigning coordinates is either in parallel to the pixel array or normal to the pixel array.

52. The method of claim **47**, wherein the optical apparatus includes at least two optical recorders, one of which is located at a reference position and another of which is located at a displaced position.

53. The method of claim **52**, wherein said at least two optical recorders are three-dimensional cameras.

54. The method of claim **52**, wherein said at least two optical recorders are two-dimensional cameras.

55. The method of claim **52**, wherein said at least two optical recorders include an electronic imaging detector comprising a pixel array and said step of assigning coordinates is either in parallel to the pixel array or normal to the pixel array.

56. The method of claim **47**, wherein said step of assigning coordinates is in alignment with the virtual calibration pattern.

57. The method of claim **47**, wherein the coordinates are assigned arbitrarily.

58. The method of claim **47**, wherein said compensating step is performed mechanically or electronically.

59. A method of calibrating an optical recorder of a three-dimensional imaging system, comprising the steps of:

projecting a calibration pattern at a calibration wavelength on a plane that is tangent to the nearest point of a desired object as measured from the optical recorder;

labeling an intersection point P between said calibration pattern and the desired object;

positioning a laser light beam operating at said calibration wavelength at the point P;

measuring the distance from the point P to said calibration pattern;

generating a second calibration pattern at a greater distance from the optical recorder; and

repeating said steps of labeling, positioning, and measuring when said second calibration pattern intersects the desired object.

60. The method of claim **59**, wherein the intersection of said calibration pattern with the desired object includes a plurality of intersection points, said method further comprising the steps of:

labeling a subset of said plurality of intersection points in numerical order starting with a first point and continuing to a last point; and

repeating said steps of positioning and measuring starting with the first point and continuing through the subset to the last point.

61. The method of claim **59**, further comprising the steps of:

generating a second calibration pattern at a greater distance from the optical recorder; and

repeating said steps of labeling, positioning, and measuring when said calibration pattern intersects the desired object.

62. A method of calibrating a three-dimensional imaging system relative to a desired object to be imaged, the three-dimensional imaging system including at least two optical recorders to be calibrated and holographic calibration plates placed in fields of view of the at least two optical recorders, wherein the holographic calibration plates contain a common holographic calibration pattern, the method comprising the steps of:

positioning the holographic calibration plates relative to each other to approximate a monolithic calibration plate;

projecting the common holographic calibration pattern into fields of view of the at least two optical recorders, wherein said fields of view include the desired object and at least three reference points whose positions relative to each of the at least two optical recorders is known;