

Author index

Entries refer to chapter number.

- Abe, R., 3.3
 Abed, M., 1.7
 Abrahams, S. C., 1.9, 1.10, 3.3
 Absar, I., 1.9
 Achenbach, G. D., 1.5
 Afonikova, N. S., 3.4
 Agafonov, A. P., 1.5
 Agranovich, V. M., 1.6, 2.3
 Agranovskaya, A. I., 1.5
 Ahn, C. H., 1.8
 Ahn, J. S., 1.5
 Aivazyan, Y. M., 1.11
 Aizu, K., 1.5, 3.1, 3.2, 3.3, 3.4
 Akai, H., 2.2
 Akai, M., 2.2
 Akhmanov, S. A., 1.7
 Akridge, J. R., 3.1
 Akulov, N., 1.5
 Alba, M., 2.1
 Albrecht, A. C., 1.7
 Alcantara Bonfim, O. F. de, 1.5
 Alder, B. J., 2.2
 Alexander, H., 3.3
 Allen, P. B., 1.8
 Al'shin, B. I., 1.5
 Altarelli, M., 1.11
 Altmann, S. L., 1.2, 2.2, 3.1, 3.4
 Ambrosch-Daxl, C., 2.2
 Amelinckx, S., 3.2, 3.3, 3.4
 Amin, A., 3.4
 Aminoff, G., 3.3
 Anastassakis, E. M., 2.3
 Andersen, O. K., 2.2
 Anderson, J. C., 1.5
 Andratskii, V. P., 1.5
 Andreazzza, P., 1.7
 Andreev, A. F., 1.5
 Anthony, T. R., 1.8
 Antonetti, A., 1.7
 Arbman, G. O., 2.2
 Arenholz, E., 1.11
 Arima, T., 1.5, 1.11
 Arlt, G., 3.3
 Armbruster, Th., 3.3
 Armstrong, J. A., 1.7
 Arndt, H., 3.1
 Arnold, H., 3.3
 Aroyo, M. I., 1.5, 1.10, 3.1, 3.2, 3.4
 Arzruni, A., 3.3
 Asaumi, K., 1.7
 Ascher, E., 1.5, 3.1
 Ashkin, A., 1.7
 Astrov, D. N., 1.5
 Aubrée, J., 3.1
 Authier, A., 1.1, 1.3, 1.11, 3.3
 Bacon, C. R., 3.1
 Badan, J., 1.7
 Bak, P., 1.10
 Baker, A. G., 3.1
 Bala, V. B., 3.1
 Balcar, E., 1.11
 Balkanski, M., 3.1
 Balluffi, R. W., 3.2, 3.3, 3.4
 Banerjee, P. P., 1.7
 Banfield, J. F., 3.3
 Banholzer, W. F., 1.8
 Barbara, B., 1.5
 Barber, D. J., 3.3
 Barkley, J. R., 3.4
 Bärnighausen, H., 3.3
 Barois, P., 1.11
 Baroni, S., 2.1
 Barrett, C. S., 3.3
 Barron, T. H. K., 1.4
 Barsch, G. R., 3.4
 Bartels, H., 3.3
 Barth, U. von, 2.2
 Baruchel, J., 1.5, 3.3
 Barz, R.-U., 3.3
 Bass, J., 1.8
 Bataille, A. M., 1.5
 Batchko, R. G., 3.4
 Bauer, P., 1.5
 Bauman, R. P., 2.3, 3.1
 Baumgartner, R. A., 1.7
 Baumhauer, H., 3.3
 Bazan, Ch., 1.5
 Bazhan, A. N., 1.5
 Bazylinski, D. A., 3.3
 Beale, T. A. W., 1.11
 Beasley, M. R., 1.8
 Beaulac, T. P., 1.8
 Becke, F., 3.2, 3.3
 Becker, R., 1.5
 Becker, R. A., 3.3
 Beest, B. W. van, 1.10
 Beier, B., 1.7
 Belov, N. V., 1.5
 Belova, E. N., 1.5
 Belyakov, V. A., 1.11
 Belyi, L. I., 1.5
 Ben Salem, M., 3.3
 Benedek, G., 2.4
 Bennema, P., 3.3
 Bérar, J.-F., 1.11
 Berestetskii, V. B., 1.11
 Berger, H., 1.8
 Bergevin, F. de, 1.11
 Berman, R., 1.8
 Bernhoeft, N., 1.11
 Bernstein, J. L., 1.7
 Berry, L. G., 3.3
 Bertagnolli, E., 3.4
 Bertaut, E. F., 1.5, 3.3
 Bethea, C. G., 1.7
 Betteridge, P. W., 3.3
 Beutier, G., 1.11
 Bhagavantam, S., 1.1
 Bickford, L. R. Jr, 1.5
 Billiet, Y., 3.3
 Billings, A., 1.1
 Bilz, H., 2.1
 Birman, J. L., 1.10, 2.3
 Birss, R. R., 1.5
 Bismayer, U., 3.3
 Bisson, S. E., 1.7
 Blachman, R., 1.7
 Black, P. J., 3.3
 Blackburn, E., 1.11
 Blackburn, J., 3.3
 Blaha, P., 2.2
 Blake, G. R., 1.5
 Blanco, J. A., 1.11
 Bland, S. R., 1.11
 Blasco, J., 1.11
 Blasius, E., 3.3
 Blattner, H., 3.2
 Blech, I., 1.10
 Bleckmann, M., 1.11
 Blinc, R., 1.10, 3.1
 Bliss, D. F., 3.3
 Blit, S., 1.7
 Blöchl, P. E., 2.2
 Bloembergen, N., 1.5, 1.7
 Bloss, F. D., 1.6, 3.2, 3.3
 Blügel, S., 2.2
 Blumberg, G. E., 3.1
 Blume, M., 1.11
 Blunt, J., 3.3
 Boček, P., 3.1
 Bögels, G., 3.3
 Boisen, M. B., 1.4, 3.4
 Bokhenkov, E. L., 2.1
 Bokov, V. A., 3.4
 Bolle, K. J., 1.7
 Bollen, D., 3.3
 Bollmann, W., 3.2, 3.3, 3.4
 Bombardi, A., 1.11
 Bonner, W. A., 3.3
 Bonneville, R., 1.7, 3.4
 Bonnin, C., 1.7
 Boon, M., 3.1
 Bordui, P. F., 1.7
 Born, M., 1.6, 2.4
 Borovik-Romanov, A. S., 1.5
 Bos, S., 1.11
 Bosenberg, W. R., 1.7
 Bosshard, C., 1.7
 Böttcher, P., 3.3
 Bouchenoire, L., 1.11
 Bouckaert, L. P., 2.2
 Boulanger, B., 1.7
 Boulesteix, C., 3.3, 3.4
 Boulillard, J.-Cl., 3.3
 Bourges, P., 2.1
 Bowen, D. K., 3.3
 Bowen, K., 3.3
 Boyd, G. D., 1.7
 Boyd, R. W., 1.7
 Boyer, L., 1.3, 2.4
 Bradler, J., 3.3
 Bradley, C. J., 2.1, 2.2, 3.1, 3.2, 3.4
 Bragg, W. L., 1.6, 3.3
 Brandmüller, J., 2.3
 Brasselet, S., 1.7
 Brauns, R. von, 3.3
 Breazeale, M. A., 1.3
 Brecht, E., 3.3
 Breitenbach, G., 1.7
 Brenier, A., 1.7
 Brewster, D., 3.3
 Bridenbaugh, P. M., 3.1
 Brillouin, L., 1.1, 1.3, 2.4
 Bringhurst, K. N., 3.3
 Bristowe, P. D., 3.3
 Brixel, W., 3.3, 3.4
 Brögger, W. C., 3.3
 Broholm, C., 1.5
 Broomé, B., 3.3
 Brosnan, S. J., 1.7
 Brouder, C., 1.11
 Brown, P. J., 1.5, 1.11
 Brugger, K., 1.3
 Brulay, J., 3.3
 Bruls, G. J. C. L., 1.8
 Brunel, M., 1.11
 Buchner, B., 1.11
 Buckley, A., 3.3
 Buda, F., 1.4
 Budden, F. J., 3.2
 Bueble, S., 3.3
 Buerger, M. J., 3.2, 3.3
 Buijnsters, J. G., 3.3
 Bul'bich, A. A., 3.4
 Bunau, O., 1.11
 Burbank, R. D., 3.3
 Burckhardt, J. J., 1.5
 Burgers, W. G., 3.3
 Bürgi, H.-B., 1.9
 Burke, K., 2.2
 Burkhardt, E., 3.3, 3.4
 Burkhardt, U., 3.3
 Bursill, L. A., 3.3
 Burstein, E., 2.3
 Bury, P. C., 3.3
 Burzlaff, H., 1.9
 Burzo, E., 1.5
 Buschow, K. H. J., 1.10
 Buseck, P. R., 3.3
 Bushuev, V. A., 1.11
 Butcher, P. N., 1.6, 1.7
 Butler, P. H., 1.2
 Butler, W. H., 1.8
 Byer, R. L., 1.7, 3.4
 Cabriol, X., 1.7
 Caciuffo, R., 1.11
 Cady, W. G., 1.1, 3.2
 Cahn, J. W., 1.10
 Cahn, R. W., 3.2, 3.3, 3.4
 Callegari, A., 3.3
 Calleja, M., 3.4
 Callen, H., 2.3
 Canali, C., 1.8
 Cao, W., 3.4
 Car, R., 1.4, 2.2
 Cardona, M., 2.3
 Cardwell, M. J., 1.5
 Carpenter, M. A., 3.4
 Carr, P., 1.11
 Carruthers, J. R., 3.3
 Catti, M., 3.3, 3.4
 Cauci, F., 3.3
 Cecchi, L., 2.4
 Ceperley, D. M., 2.2
 Cernik, R. J., 1.11
 Chabbal, R., 2.4
 Chainani, A., 1.11
 Chakraborty, B., 1.8
 Chalmers, A. F., 3.3
 Chalmers, B., 3.3
 Champeney, D. C., 1.11
 Chan, L. Y. Y., 3.1
 Chantrel, H., 2.4
 Chapon, L. C., 1.5
 Chappert, J., 1.5
 Chapuis, G., 1.10
 Chatterji, T., 1.5
 Chauvet, O., 1.8
 Chemla, D., 3.4
 Chemla, D. S., 1.7
 Chen, C. T., 1.11
 Chen, Q., 3.1
 Chen, X. J., 3.4
 Cheng, K., 1.7
 Cheong, S. W., 1.5
 Chernysheva, M. A., 3.2, 3.3
 Chirila, R., 3.3
 Cho, B. K., 1.11
 Chopdekar, R. V., 1.11
 Christian, J. W., 3.3, 3.4
 Chrosch, J., 3.4
 Chu, C. W., 1.5, 3.1
 Chung, H., 3.3
 Chung, J., 1.7
 Chung, S. J., 3.3
 Claringbull, G. F., 3.3
 Clark, A. E., 1.5
 Claus, R., 2.3
 Clin, M., 3.3, 3.4
 Cline, T. W., 3.4
 Cochran, W., 3.1
 Colle, R., 2.2
 Collin, G., 2.1
 Collins, S., 1.11
 Collins, S. P., 1.11
 Colson, D., 1.5
 Condon, E. U., 2.2
 Connes, P., 2.4
 Conrad, D., 3.3
 Cooper, B. R., 1.5
 Cooper, R. I., 3.3
 Coquillay, A., 1.7
 Cotter, D., 1.6, 1.7
 Cottrell, A. H., 3.3
 Courtens, E., 2.4
 Cowley, J. M., 3.3
 Cowley, R. A., 3.1
 Cox, D. E., 1.5, 3.1
 Cox, K. G., 1.6
 Cracknell, A. P., 1.5, 2.1, 2.2, 3.1, 3.2, 3.4
 Cross, L. E., 1.5, 3.3, 3.4
 Cummins, H. Z., 2.4

AUTHOR INDEX

- Curie, J., 1.1
 Curie, P., 1.1, 1.5, 3.3
 Curien, H., 3.3, 3.4
 Czopnik, A., 1.11
- Dabkowska, H. A., 1.11
 Daneu, N., 3.3
 Darkwa, J., 3.3
 Davey, R. J., 3.3
 Dawson, B., 1.11
 De Bergevin, F., 1.11
 De Boissieu, M., 1.10
 De Gironcoli, S., 1.4, 2.1
 De la Flor, G., 1.5
 De Launay, J., 1.3
 Debusschert, T., 1.7
 Dederichs, P. H., 2.2
 Delley, B., 3.3
 Dénoyer, F., 1.10
 DeSavage, B. F., 1.5
 Detlefs, C., 1.11
 Devanarayanan, S., 1.4
 Devarajan, V., 1.6
 Devonshire, A. F., 3.1
 Devouard, B., 3.3
 Di Matteo, S., 1.11
 Dimmock, J. O., 3.1
 Ding, D.-H., 1.10
 Dmitrienko, V. E., 1.11
 Dmitriev, V., 3.1, 3.4
 Dmitriev, V. G., 1.7
 Docherty, R., 3.3
 Dodge, J. S., 1.8
 Doert, Th., 3.3
 Dolinchuk, S. G., 1.7
 Dolino, G., 3.4
 Donaldson, W., 1.7
 Donnay, G., 3.2, 3.3
 Donnay, J. D. H., 3.2, 3.3, 3.4
 Donnelly, R. A., 2.2
 Döring, W., 1.5
 Dorner, B., 2.1
 Dou, S. X., 1.7
 Douady, J., 1.7
 Dougherty, J. P., 1.7
 Dove, M. T., 2.1, 3.4
 Drabold, D. A., 2.2
 Dreizler, R. M., 2.2
 Dries, L. T., 3.1
 Driscoll, T. A., 1.7
 Drittler, B., 2.2
 Drobyshev, L. A., 1.5
 Ducuing, J., 1.7
 Dudley, M., 3.3
 Dudnik, E. F., 3.3, 3.4
 Dufek, P., 2.2
 Dunitz, J. D., 1.9, 3.3
 Dunn, M. H., 1.7
 Dusek, M., 3.3
 Dvořák, V., 3.1
 D'Yvoire, F., 3.3
 Dziedzic, J. M., 1.7
 Dzyaloshinskii, I. E., 1.5
- Easterling, K. E., 3.3
 Ebert, H., 2.2
 Ebrahimzadeh, M., 1.7
 Eckardt, R. C., 1.7
 Eckold, G., 2.1
 Edwards, P. P., 3.3
 Edwards, T. J., 1.7
 Egelstaff, P. A., 2.4
 Eger, D., 1.7, 3.4
 Eibschütz, M., 3.1
 Eichhorn, K., 1.11
 Eimerl, D., 1.7
 Eitel, M., 3.3
 El-Korashy, A., 3.3
 Ellis, D. E., 2.2
 Ellner, M., 3.3
 Elsässer, C., 2.2
 Enculescu, I., 3.3
 Engel, G., 3.3
 Ephraim, M., 1.2
- Eremenko, V. V., 1.5
 Erhart, J., 3.4
 Ernst, E., 3.3
 Ernst, F., 3.3
 Ernzerhof, M., 2.2
 Errandonea, G., 3.1
 Erskine, J. L., 1.11
 Esteva, J.-M., 1.11
 Etchepare, J., 1.7
 Evans, H. T., 3.3
 Evans, J. S. O., 1.4
 Every, A. G., 1.3
 Ewald, P. P., 1.6
 Ewert, D., 3.3
 Eyring, L., 3.3
- Faber, J., 1.5
 Fabre, C., 1.7
 Fabrizi, F., 1.11
 Fabrizio, M., 1.11
 Fahlen, T. S., 1.7
 Fähnle, M., 2.2
 Fatuzzo, E., 3.4
 Favre-Nicolin, V., 1.11
 Fedosejevs, R., 1.7
 Fefer, E. M., 3.1
 Feigelson, R. S., 1.7
 Feldmann, W. L., 3.3
 Fernández-Rodríguez, J., 1.11
 Ferrari, J. M., 1.5
 Ferraris, G., 3.3, 3.4
 Ferré, J., 1.3, 1.5
 Fesenko, E. G., 3.4
 Féve, J. P., 1.7
 Fiebig, M., 1.5
 Fimberg, T. A., 3.1
 Finkelstein, K. D., 1.11
 Finnis, M. W., 3.3
 Fischer, K., 1.11
 Fischer, M., 1.3
 Fischermeister, H. F., 3.2
 Fisher, M. E., 1.5
 Fishman, N. S., 3.3
 Fix, A., 1.7
 Flack, H. D., 3.3
 Fleischer, J. F., 1.8
 Fleming, S. D., 3.3
 Fleury, P. A., 3.1
 Flükiger, R., 3.3
 Folen, V. J., 1.5
 Follner, H., 3.3
 Foner, S., 1.5
 Force, E. R., 3.3
 Forget, A., 1.5
 Forro, L., 1.8
 Fossheim, K., 3.1
 Fousek, J., 3.3, 3.4
 Fox, D. L., 3.1
 Frahm, R., 1.11
 François, M., 3.3, 3.4
 Frankel, R. B., 3.1, 3.3
 Franken, P., 1.7
 Franz, R., 1.8
 Frazer, B. C., 1.5
 Freeman, A. J., 1.5
 Freeman, P., 3.3
 Frey, T., 1.9
 Fridkin, V. M., 3.2
 Friedel, G., 2.4, 3.2, 3.3, 3.4
 Friedel, J., 3.3
 Fritsch, K., 2.4
 Frondel, C., 3.3
 Frota-Pessoa, S., 2.2
 Fugle, J. C., 1.11
 Fukano, Y., 3.3
 Fuksa, J., 3.2, 3.4
 Fumi, F. G., 1.1, 1.3
 Fyfe, C., 3.3
- Gaal, P. S., 1.4
 Gagulin, V. V., 1.5
 Gallego, S. V., 1.5
 Gao, Y., 3.3
- García, J., 1.11
 Garito, A. F., 1.7
 Gault, H. R., 3.3
 Gavrilchenko, B. G., 3.4
 Geballe, T. H., 1.8
 Geck, J., 1.11
 Gehring, G. A., 1.5
 Gelatt, C. D. Jr., 2.2
 Geldart, D. J. W., 1.8
 Geller, S., 3.1
 Gerson, R., 1.5
 Gesland, J. Y., 1.3
 Geusic, J. E., 1.7
 Gevers, R., 3.3
 Ghigna, P., 1.11
 Ghose, S., 3.4
 Giacobino, E., 1.7
 Giacovazzo, C., 3.2
 Giannozzi, P., 2.1
 Gibbs, D., 1.11
 Gibbs, G. V., 1.4, 3.4
 Gignoux, D., 1.5
 Gijssman, H. M., 1.5
 Gille, P., 3.3
 Gillert, M., 1.7
 Ginzburg, V. L., 1.6, 2.3
 Girvin, S. M., 1.8
 Glass, A. M., 1.6, 3.1, 3.4
 Glazer, A. M., 1.6
 Gleeson, H., 1.11
 Gnatchenko, S. L., 1.5
 Godby, R. W., 2.2
 Goedkoop, J. B., 1.11
 Gold, A., 3.4
 Goldman, A. I., 1.11
 Goldsmid, H. J., 1.8
 Gorbatsevich, A. A., 1.5
 Gordon, L. A., 1.7
 Gordon, S. G., 3.3
 Gornall, W. S., 2.4
 Goto, T., 1.5
 Gottschalk, H., 3.3
 Gottstein, G., 3.2, 3.3
 Götz, D., 3.3
 Goulon, J., 1.11
 Goulon-Ginet, C., 1.11
 Graeme-Barber, A., 3.3, 3.4
 Gramaccioli, C. M., 1.9
 Grassl, M., 3.3
 Gratias, D., 1.10
 Green, R. E., 1.3
 Greer, A. L., 3.1
 Grell, H., 3.4
 Grell, J., 3.4
 Griffin, D. T., 3.3
 Grillon, G., 1.7
 Grimmer, H., 1.5, 3.3
 Grimvall, G., 1.8
 Gross, E., 2.4
 Gross, E. K. U., 2.2
 Grossmann, G., 2.2
 Groth, P., 1.6, 3.3
 Groves, G. W., 3.3
 Grumbach, M. P., 2.2
 Gruverman, A. L., 3.4
 Gu, M., 3.1
 Guccione, R., 1.5
 Guenzburger, D., 2.2
 Gufan, Yu. M., 3.4
 Guggenheim, H. J., 3.1
 Guha, S., 1.5
 Gukasov, A., 1.5, 1.11
 Gunnarsson, O., 2.2
 Güntherodt, G., 2.3
 Guo, Y., 3.3
 Gupta, P. K., 1.7
 Gurzadian, G. G., 1.7
 Gust, W., 3.3
 Gustafson, E. K., 1.7
 Guzei, I., 3.3
- Habbal, F., 3.1
 Hadni, A., 1.7
 Haegle, E., 3.3
- Haga, Y., 1.11
 Hagiwara, K., 1.11
 Hahn, F., 3.3
 Hahn, T. A., 1.4
 Hahn, Th., 1.10, 1.11, 2.1, 3.2, 3.3, 3.4
 Hajdukovic, G., 3.1
 Halbout, J. M., 1.7
 Hall, M. Jr., 3.2
 Hamann-Borrero, J. E., 1.11
 Hámós, L. von, 3.2
 Hannon, J. P., 1.11
 Hardouin-Duparc, O. B. M., 3.3
 Hariharan, P., 2.4
 Harmon, B. N., 1.11, 2.2
 Harris, A. B., 1.5
 Harris, S. E., 1.7
 Harshmann, D. R., 1.11
 Hart, M., 1.11
 Hartman, P., 3.3
 Hartshorne, N. H., 1.6
 Hatanaka, T., 1.7
 Hatch, D. M., 1.2, 3.1, 3.4
 Hatt, R. A., 3.4
 Häüy, R.-J., 3.2
 Hawthorne, F. C., 3.3
 Hayden, L. M., 1.7
 Hayes, W., 2.3, 2.4
 Hazell, R. G., 1.9
 He, J. P., 1.5
 He, J.-P., 1.11
 Hedin, L., 2.2
 Heesch, H., 1.5
 Heger, G., 3.3
 Hehl, F. W., 1.5
 Heide, F., 3.3
 Heiming, A., 2.1
 Hellström, J., 1.7
 Henderson, A. J., 1.7
 Henke, H., 3.3
 Herbstein, F. H., 3.3
 Herbst-Irmer, R., 3.3
 Hercher, M., 2.4
 Herman, W. N., 1.7
 Herrero-Martín, J., 1.11
 Herres, N., 3.3
 Herting-Agthe, S., 3.3
 Hervieu, M., 3.3
 Herzig, C., 2.1
 Herzig, P., 1.2, 2.2, 3.1, 3.4
 Hierle, R., 1.7
 Hildmann, B. O., 3.3
 Hill, A. E., 1.7
 Hill, J. P., 1.11
 Hiralal, I. D. K., 3.3
 Hirst, L., 1.11
 Hobden, M. V., 1.7
 Hodeau, J.-L., 1.11
 Hoffmann, D., 3.3
 Hoffmann, E., 3.3
 Hoffmann, R., 2.2
 Hofmeister, H., 3.3
 Hohenberg, P., 2.2
 Holser, W. T., 3.3, 3.4
 Honda, T., 1.5
 Honig, J., 1.11
 Hor, P. H., 3.1
 Horie, K., 1.11
 Horiuchi, N., 1.7
 Hornstra, J., 3.3
 Hou, S. L., 1.5
 Houchmandzadeh, B., 3.4
 Housley, R. M., 3.3
 Hu, C.-Z., 1.10
 Hu, X. B., 3.4
 Hua, X., 3.3
 Huang, C., 1.11
 Huang, C. Y., 3.1
 Huang, X. R., 3.3, 3.4
 Hulin, D., 1.7
 Hulm, J. K., 3.1
 Hummel, W., 1.9
 Hummler, K., 2.2
 Hur, N., 1.5
 Hurlbut, C. S. Jr., 3.3

AUTHOR INDEX

- Hurle, D. T. J., 3.3
 Hurst, V. J., 3.3
 Hybertsen, M. S., 2.2
- Ibanez, A., 1.7
 Iga, F., 1.11
 Iida, S., 1.5
 Ikeda, T., 1.1
 Ikeno, S., 3.3
 Iliescu, B., 3.3
 Indenbom, V. L., 1.5, 3.1, 3.2, 3.4
 Ipatova, I. P., 2.1
 Isaacs, E. D., 1.11
 Ishibashi, Y., 3.3, 3.4
 Ishida, K., 1.11
 Ishii, K., 1.11
 Ishimasa, T., 3.3
 Ishizaka, K., 1.5
 Isupov, V. A., 1.5, 3.4
 Ito, H., 1.7
 Ito, R., 1.7
 Ivanov, A. S., 2.1
 Ivanov, N. R., 3.3, 3.4
 Izumov, Yu. A., 1.5, 3.1
- Jaccard, D., 1.8
 Jackson, J. D., 1.5
 Jacobi, H., 3.3
 Jacoboni, C., 1.8
 Jacques, V. L. R., 1.11
 Jahn, H. A., 1.9
 James, W. J., 1.5
 Jamsek-Vilfan, M., 3.1
 Janak, J. F., 2.2
 Janner, A., 1.2, 1.10
 Janovec, V., 3.1, 3.2, 3.3, 3.4
 Jansen, H. B., 2.2
 Jansen, L., 3.1
 Janssen, T., 1.2, 1.10, 3.2
 Jaouen, N., 1.11
 Jarlborg, T., 1.8
 Javorsky, P., 1.11
 Jeitschko, W., 3.3, 3.4
 Jennissen, H.-D., 3.3
 Jerphagnon, J., 1.7, 3.4
 Jessen, S. M., 1.4
 Ji, R.-F., 3.1
 Ji, S., 1.11
 Jia, C. L., 3.3
 Jiang, S. S., 3.4
 Johnsen, A., 3.3
 Johnson, C. K., 1.9
 Johnson, R. D., 1.11
 Joly, Y., 1.11
 Jona, F., 1.6, 3.3, 3.4
 Jonas, S., 1.5
 Jones, R., 3.3
 Jones, R. C., 1.6
 Jonson, M., 1.8
 Joon, E. R., 3.1
 Jorda, J.-L., 3.3, 3.4
 Joshua, S. J., 1.5
 Josse, D., 1.7
 Judd, J. W., 3.3
 Juhin, A., 1.11
 Juksrud, S., 3.1
 Julliard, J., 1.3
 Jundt, D. H., 1.7
 Jung, J.-H., 1.11
 Junghans, T., 3.3
 Junod, A., 1.8
- Kaczorowski, D., 1.11
 Kadeckova, S., 3.3
 Kadomtseva, A. M., 1.5
 Kahlenberg, V., 3.3
 Kahr, B., 3.3
 Kalonji, G., 3.2, 3.4
 Kalus, J., 2.1
 Kaminow, I. P., 1.6
 Kaminsky, W., 1.6
 Kanazawa, M., 1.11
 Kaned, Y., 1.7
 Kaneko, Y., 1.5, 1.11
- Känzig, W., 3.2, 3.4
 Kapitulnik, A., 1.8
 Kappler, J.-P., 1.11
 Karlsson, H., 1.7
 Karnatak, R., 1.11
 Kato, K., 1.7
 Kato, N., 3.3
 Katsui, A., 3.3
 Katz, M., 1.7, 3.4
 Kaufmann, E. N., 2.2
 Kawada, H., 1.11
 Kawakami, S., 1.5
 Kawase, K., 1.7
 Kawata, H., 1.11
 Kay, H. F., 3.2
 Kaz, A., 1.7
 Kazei, Z. A., 1.5
 Kearley, G., 2.4
 Keester, K. L., 3.3
 Kelly, A., 3.3
 Kenle, P., 1.11
 Kennedy, G. T., 1.7
 Kenzelmann, M., 1.5
 Kerber, A., 3.2
 Kerr, P. F., 1.6
 Khan, F. S., 1.8
 Kharchenko, N. F., 1.5
 Khodja, S., 1.7
 Khomskii, D., 1.5
 Kikkawa, A., 1.11
 Kim, J. Y., 1.11
 Kim, M. G., 1.11
 Kim, S. B., 1.5
 Kimura, K., 1.5
 Kimura, T., 1.5
 Kirschel, A., 1.11
 Kiselev, S. V., 1.5
 Kittinger, E., 3.4
 Klapper, H., 3.2, 3.3
 Klassen-Neklyudova, M. V., 3.2, 3.3, 3.4
 Klein, C., 3.2, 3.3
 Klein, L., 1.8
 Kleinman, D. A., 1.7
 Klemens, P. G., 1.8
 Knappe, R., 1.7
 Knight, K. S., 1.11
 Knorr, K., 3.3
 Knox, R. S., 3.4
 Kobayashi, J., 3.1
 Koch, A., 3.3
 Koch, E., 3.2, 3.3, 3.4
 Koch, K., 1.7
 Kociński, J., 3.1
 Koelling, D. D., 2.2
 Kogure, T., 3.3
 Kohn, J. A., 3.3
 Kohn, W., 2.2
 Kojima, T., 1.11
 Kokubun, J., 1.11
 Kolar, D., 3.3
 Kolpakov, A. V., 1.11
 Kominak, G. J., 3.1
 Koňák, Č., 3.3, 3.4
 Kondo, T., 1.7
 Koo, J., 1.11
 Kopaev, Yu. V., 1.5
 Kopcić, V. A., 3.4
 Kopský, V., 1.5, 1.10, 3.1, 3.2, 3.3, 3.4
 Koptsič, J. N., 1.5
 Koptsič, V. A., 1.5, 1.10, 3.2
 Kornienko, N. E., 1.7
 Korringa, J., 2.2
 Koshino, S., 1.8
 Koster, G. F., 3.1
 Kotler, Z., 1.7
 Kotrbova, M., 3.3
 Kouvel, J. S., 1.5
 Kovalev, O. V., 1.2, 1.5, 2.1
 Kovrygin, A. I., 1.7
 Kozlov, G. V., 3.1
 Krafczyk, S., 3.3
 Krainik, N. N., 3.4
 Kramer, J. J., 1.5
- Krause, C., 3.4
 Krempel, P., 3.3
 Kress, W., 2.1
 Kreyssig, A., 1.11
 Krisch, M. H., 2.4
 Krishnamurthy, N., 1.1
 Krishnan, R. S., 1.4
 Krynetskii, I. B., 1.5
 Kübler, J., 2.2
 Kubota, M., 1.11
 Kuhs, W. F., 1.9
 Kulp, T. J., 1.7
 Kumaraswamy, K., 1.1
 Kundt, A., 3.3
 Kuo, P. K., 1.8
 Küppers, H., 1.4
 Kuratowski, K., 3.2
 Kurki-Suonio, K., 2.2
 Kurtz, S. K., 1.7
 Kuscholke, B., 3.3
 Kuzhukeev, Zh.-N. M., 1.5
 Kuzmicheva, G. M., 3.3
 Kuz'min, R. N., 1.11
 Kuzminov, E. G., 3.1
 Kuznetsov, P. I., 1.9
 Kuzushita, K., 1.11
- Laan, G. van der, 1.11
 Laegreid, T., 3.1
 Lahajnar, G., 3.1
 Lai, X., 3.3
 Lajzerowicz, J., 3.4
 Lal, K., 3.3
 Lan, Z., 3.3
 Landau, L. D., 1.5, 3.1, 3.2
 Lander, G. H., 1.5, 1.11
 Lang, A. R., 3.3
 Lang, S., 3.2
 Larson, D. J., 3.3
 Laundy, D., 1.11
 Laurell, F., 1.7
 Lax, M., 2.4
 Lax, M. J., 2.3
 Lazay, P. D., 2.4
 Lazzari, M., 1.4
 Le Corre, Y., 3.3, 3.4
 Le Gall, H., 1.5
 Le Page, Y., 3.3
 Lebeugle, D., 1.5
 Lecomte, M., 1.3
 Ledermann, W., 3.2
 Ledoux, I., 1.7
 Lee, E. W., 1.5
 Lee, G., 1.5
 Lee, J. G. P. S., 1.11
 Lee, K.-B., 1.11
 Lee, W.-Y., 3.3
 Lee, Y. B., 1.11
 Lefaucheux, F., 1.7, 3.3
 LeGarrec, B., 1.7
 Leibfried, G., 2.1
 Lepers, C., 1.7
 Letuchev, V. V., 3.4
 Levanyuk, A. P., 3.1, 3.4
 Levin, K. H., 1.7
 Levine, B. F., 1.7
 Levinstein, H. J., 1.7, 3.3
 Levitin, R. Z., 1.5
 Levy, H. A., 1.9
 Levy, M., 2.2
 Lewis, J. G., 1.6
 Leycuras, C., 1.5
 Lichnerowicz, A., 1.1
 Lieber, W., 3.3
 Lieberman, H. F., 3.3
 Liebisch, Th., 3.3
 Lifshitz, E. M., 1.5, 1.11, 3.1
 Lindsay, I. D., 1.7
 Lines, M. E., 1.6, 3.1, 3.4
 Lippmann, G., 1.1
 Lipschutz, S., 3.2
 Lipscomb, G. F., 1.7
 Litvin, D. B., 1.5, 3.4
 Litvinenko, Yu. G., 1.5
- Litzler, A., 3.1
 Liu, J. S., 3.4
 Liu, W. J., 3.4
 Locherer, K. R., 3.4
 Lociano, G. M., 3.3
 Loran, J., 3.3
 Lorenz, B., 1.5
 Lorenzo, E., 1.11
 Lorenzo, J. E., 1.11
 Loucks, T. L., 2.2
 Loudon, R., 2.3, 2.4
 Louie, G., 2.2
 Louisell, W. H., 1.7
 Love, W. F., 1.2
 Lovesey, S. W., 1.11
 Lowry, T. M., 1.6
 Lubensky, T. C., 1.10
 Lucas, D. W., 3.1
 Lukina, M. M., 1.5
 Lundqvist, B. I., 2.2
 Luo, J., 1.11
 Lynch, R. T., 1.7
 Lynn, J. W., 1.5
 Lytle, F. W., 3.1
 Lyubarskii, G. Ya., 3.1
 Lyubimov, V. N., 1.5
- Ma, Y., 1.11
 MacDonald, A. H., 1.8
 MacFarlane, R. M., 3.1
 Mach, J. E., 2.4
 Machonksý, L., 3.4
 Mackenzie, G. A., 2.1
 Mader, W., 3.3
 Magel, G. A., 1.7
 Mahan, G. D., 1.8
 Maisch, W. G., 1.5
 Mallard, E., 3.2, 3.3
 Mang, H., 3.3
 Man'ko, V. I., 1.5
 Mannix, D., 1.11
 Manolakis, C., 3.3
 Maradudin, A. A., 2.1
 Marchenko, V. I., 1.5
 Marin, C., 1.11
 Marnier, G., 1.7
 Marri, I., 1.11
 Marshall, D. B., 3.3
 Marshall, L. R., 1.7
 Martin, R. A., 2.2
 Maruyama, H., 3.3
 Mary, T. A., 1.4
 Masciovecchio, C., 2.4
 Mason, B., 3.3
 Mason, W. P., 1.1, 1.5
 Massa, W., 3.3
 Massalski, T. B., 3.3
 Masse, R., 1.7
 Matarrese, L. M., 1.5
 Materlik, G., 1.11
 Mathieu, J. P., 2.3
 Matsubara, M., 1.11
 Matsumami, M., 1.11
 Matsumura, T., 1.11
 Matthias, B., 3.2
 Matthiessen, A., 1.8
 Mazzoli, C., 1.11
 McBride, J. M., 3.3
 McCurdy, A. K., 1.3
 McEwen, K. A., 1.11
 McLaren, A. C., 3.3
 McMorrow, D. F., 1.11
 McNutt, D. P., 2.4
 McQueeney, R. J., 1.11
 McSkimin, H. J., 1.3
 McWhan, D. B., 1.11
 Meekes, H., 3.3
 Mehendale, S. C., 1.7
 Melcher, R. L., 1.3
 Ménaert, B., 1.7
 Meng, R. I., 3.1
 Menzer, G., 3.3
 Mercier, M., 1.5
 Mercier, R., 1.5

AUTHOR INDEX

- Merkle, K. L., 3.3
 Merkulov, V. S., 1.5
 Mermin, N. D., 1.11
 Merten, L., 2.3
 Merz, W., 3.2
 Merz, W. J., 3.4
 Messner, T., 3.3
 Metcalf, P., 1.11
 Methfessl, M., 2.2
 Meyer, B., 2.2
 Michard, F., 1.3
 Michel, C., 3.3
 Michel, Ch., 1.5
 Michel, L., 3.2
 Midwinter, J. E., 1.7
 Miekeley, W., 2.1
 Migus, A., 1.7
 Mikvabia, V. D., 3.1
 Miller, A., 1.7
 Miller, C. S., 3.4
 Miller, G. D., 3.4
 Miller, S. C., 1.2
 Mills, D., 1.11
 Milov, V. N., 1.5
 Milton, J. T., 1.7
 Minella, D., 1.5
 Ming, N. B., 3.3
 Mirza, K., 3.3
 Mirzoyants, G. I., 3.1
 Mitrofanov, N. L., 2.1
 Mitsui, T., 3.4
 Miuskov, V. F., 3.3
 Miyasaka, S., 1.5
 Mlynec, J., 1.7
 Modesti, S., 1.11
 Mohs, F., 3.2
 Molchanov, V. N., 3.3
 Momozawa, N., 1.11
 Monaco, G., 2.4
 Montroll, E. W., 2.1
 Mooij, J. H., 1.8
 Moore, G. T., 1.7
 Moore, M., 3.3
 Moreau, J.-M., 1.5
 Morellón, L., 1.11
 Morgenroth, W., 1.11
 Morin, F. J., 1.5
 Morita, R., 1.7
 Moritomo, Y., 1.11
 Moriawaki, T., 1.11
 Moriya, T., 1.5
 Morrell, J. A., 1.7
 Moskvin, A. S., 1.5
 Mostovoy, M., 1.5
 Mostowski, A., 3.2
 Moxon, J. R. L., 1.6
 Mueller, H., 3.2
 Mügge, O., 3.3
 Mukhin, A. A., 1.5
 Mulders, A. M., 1.11
 Müller, W. F., 3.3
 Münster, C., 1.6
 Munyanaza, A., 3.3
 Murakami, Y., 1.11
 Murnaghan, F. D., 1.3
 Myers, L. E., 1.7
 Naish, V. E., 1.5
 Nakamura, E., 3.4
 Nakamura, K., 1.7
 Nakamura, T., 1.11
 Nakao, H., 1.11
 Narang, R. S., 1.7
 Narasimhamurty, T. S., 1.6
 Nassau, K., 3.3
 Natkaniec, I., 2.1
 Natoli, C. R., 1.11
 Naumann, C. F., 3.2
 Naumenko, V. M., 1.5
 Nazarenko, E., 1.11
 Nebel, A., 1.7
 Néel, L., 1.5
 Nelmes, R. J., 1.9
 Nelson, D. F., 2.4
 Neronova, N. N., 1.5
 Nespolo, M., 3.3
 Neubeck, W., 1.11
 Neumann, F., 1.1
 Neumann, W., 3.3
 Newnham, R. E., 1.1, 1.5, 3.3, 3.4
 Nicoud, J. F., 1.7
 Niedermayer, C., 1.5
 Niggli, P., 3.2, 3.3
 Niizeki, N., 3.3
 Nikogosyan, D. N., 1.7
 Nikolaeva, E. V., 3.4
 Nimmo, J. K., 3.1
 Niu, Z., 3.1
 Nord, G. L., 3.3
 Nouet, J., 1.3
 Novak, J., 3.3
 Novakovich, A. A., 1.11
 Novikovskii, N., 1.11
 Nowick, A. S., 1.1, 3.1
 Nusair, M., 2.2
 Nusimovici, M., 3.1
 Nussbaum, A., 1.6
 Nye, J. F., 1.1, 1.4, 1.7, 1.11, 2.3, 3.1, 3.4
 Oberto, R., 3.3
 Obukhov, Y. N., 1.5
 O'Dell, T. H., 1.5
 Offenberger, A., 1.7
 Ogasawara, N., 1.7
 Oh, B. H., 1.11
 Ohashi, H., 1.11
 Okamoto, J., 1.11
 Oliver, W. F., 3.1
 Onsager, L., 1.1
 Onuki, Y., 1.11
 Opechowski, W., 1.5, 3.2, 3.4
 Ordejon, P., 2.2
 Orlova, M. P., 1.5
 Orna, J., 1.11
 Oron, M., 1.7, 3.4
 Ossipyan, Yu. A., 3.4
 Ottaviani, G., 1.8
 Oudar, J. L., 1.7
 Oura, M., 1.11
 Ovchinnikova, E. N., 1.11
 Ozerov, R. P., 1.5
 Ozhogin, V. I., 1.5
 Pacaud, O., 1.7
 Pach, K., 1.9
 Paixao, J. A., 1.11
 Palatinus, L., 3.3
 Palke, W. A., 2.2
 Palm, J. H., 1.9
 Palmer, D. C., 3.3, 3.4
 Paolasini, L., 1.11
 Pappis, J., 1.5
 Park, J.-H., 1.11
 Park, S., 1.5
 Park, Y. J., 1.11
 Parkinson, G. M., 3.3
 Parr, R., 2.2
 Parrinello, M., 1.4, 2.2
 Partzsch, S., 1.11
 Pasiskevicius, V., 1.7
 Pasteur, L., 1.1
 Pasynkov, R. E., 3.4
 Patera, J., 3.1
 Patzer, G., 3.3
 Paufler, P., 1.1
 Pauthenet, R., 1.5
 Pavone, P., 2.1
 Pawley, G. S., 2.1
 Pearson, G. L., 3.3
 Peercy, P. S., 3.1
 Penn, R. L., 3.3
 Penzkofer, A., 1.7
 Perdew, J. P., 2.2
 Perez-Mato, J. M., 1.5, 1.10, 3.1
 Périgaud, A., 1.7
 Perkins, P. E., 1.7
 Perry, J. W., 1.7
 Perry, T. T., 1.7
 Pershan, P., 1.7
 Petcov, A., 1.11
 Peterlin-Neumaier, T., 1.5
 Peters, C. W., 1.7
 Peterse, W. J. A. M., 1.9
 Petricek, V., 1.10, 3.3
 Petrilli, H. M., 2.2
 Petrov, S. B., 1.5
 Petry, W., 2.1
 Petzelt, J., 3.1
 Phakey, P. P., 3.3
 Phillips, F. C., 3.3
 Phillips, R. A., 1.6
 Pick, R., 3.1
 Pierce, J. W., 1.7
 Pinczuk, A., 2.3
 Pindak, R., 1.11
 Pine, A. S., 2.4
 Pinski, F. J., 1.8
 Pintschovius, L., 2.1
 Pisani, C., 2.2
 Pisarev, R. V., 1.3
 Pitaevskii, L. P., 1.11
 Platzman, P. M., 1.11
 Pliszka, P., 1.7
 Pluth, J. J., 3.3
 Pohalski, C. C., 1.7
 Pond, R. C., 3.2, 3.4
 Poole, A., 1.5
 Popov, S. N., 1.5
 Popov, Yu. F., 1.5
 Porter, D. A., 3.3
 Porto, S. P. S., 2.3, 3.1
 Pósfai, M., 3.3
 Pot, T. M., 3.3
 Poulet, H., 2.3
 Pouligny, B., 3.1
 Poulis, N. J., 1.5
 Powers, P. E., 1.7
 Prasad, V., 3.3
 Pratt, W. P., 1.8
 Prewitt, C. T., 3.1
 Price, P. F., 1.9
 Primot, J., 3.1
 Princep, A. J., 1.11
 Pritchard, R. G., 3.3
 Přívratská, J., 3.4
 Proietti, M. G., 1.11
 Prokhorov, A. S., 1.5
 Prokhorova, S. D., 3.1
 Prout, K., 3.3
 Pryor, A. W., 1.9
 Pryor, R. W., 1.8
 Puccetti, G., 1.7
 Punin, Y., 3.3
 Punin, Yu. O., 3.3
 Putnis, A., 3.3, 3.4
 Pyka, N., 2.1
 Pyykkö, P., 2.2
 Qin, Z.-K., 3.1
 Qiu, P., 1.7
 Quaranta, A. A., 1.8
 Queisser, H. J., 3.3
 Raaz, F., 3.3
 Radaelli, P. G., 1.5
 Rado, G. T., 1.5
 Raghorthamachar, B., 3.3
 Raj, R., 1.7
 Ramaswamy, S., 1.10
 Ramdohr, P., 3.3
 Raselli, A., 1.9
 Räuber, A., 3.3
 Raveau, B., 3.3
 Ravez, J., 3.1
 Raymakers, R. J., 1.7
 Razé, G., 1.7
 Read, W. T., 3.3
 Rebane, L., 3.1
 Rečník, A., 3.3
 Redfern, S., 3.3
 Reichardt, W., 2.1
 Reid, D. T., 1.7
 Reintjes, J., 1.7
 Reissland, J. A., 2.1
 Remeika, J. P., 1.11, 3.1
 Renard, M., 1.7
 Renevier, H., 1.11
 Renninger, M., 3.3
 Renshaw, A. R., 1.6
 Revaz, B., 1.8
 Revcolevschi, A., 3.3
 Rhyee, J. S., 1.11
 Ribeiro, J. L., 1.10
 Ribet, M., 3.3
 Richards, R. P., 3.3
 Richterová, L., 3.4
 Rieder, H., 1.5
 Rijkeboer, A., 3.3
 Rinaldi, R., 3.3
 Ripamonti, C., 1.1
 Rivera, J.-P., 1.5, 3.3, 3.4
 Robert, M. C., 3.3
 Roberts, K. J., 3.3
 Robinson, D. J. S., 3.2
 Rode, D. L., 1.8
 Rodríguez-Fernández, A., 1.11
 Rodrigues, A. R. D., 1.11
 Roessler, F. L., 2.4
 Roessli, B., 1.5
 Rogalev, A., 1.11
 Rohl, A. L., 3.3
 Romé de l'Isle, J. B. L., 3.2
 Rose, G., 3.3
 Rosen, H., 3.1
 Rosen, J., 3.2
 Rosenman, G., 1.7, 3.4
 Rosker, M. J., 1.7
 Rosová, A., 3.4
 Rostocker, N., 2.2
 Roth, G., 3.3
 Roth, W. L., 1.8
 Roucau, C., 3.4
 Rousseau, D. L., 2.3, 3.1
 Rousseau, I., 1.7
 Rousseau, M., 1.3
 Route, R. K., 1.7
 Rowe, D. M., 1.8
 Röwer, R. W., 3.3
 Rudashevskii, E. G., 1.5
 Rudolph, P., 3.3
 Ruffing, B., 1.7
 Rühle, M., 3.3
 Rumiantsev, A. Yu., 2.1
 Rumyantsev, E. L., 3.4
 Ruocco, G., 2.4
 Ruse, G. F., 3.1
 Ruvimov, S., 3.3
 Rychetský, I., 3.4
 Rytz, D., 1.7
 Sainctavit, P., 1.11
 Saint-Grégoire, P., 3.4
 Sakudo, T., 3.1
 Sakurai, K., 3.3
 Salamon, M. B., 1.8
 Salje, E. K. H., 1.3, 3.3, 3.4
 Salvetti, O., 2.2
 Sánchez, M. C., 1.11
 Sanchez del Rio, M., 1.11
 Sandercock, J. R., 2.4
 Sandratskii, L. M., 2.2
 Sands, D. E., 1.1
 Sandvold, E., 3.1
 Sannikov, D. G., 3.1
 Santi, G., 1.8
 Santoro, A., 3.3
 Santoro, R. P., 1.5
 Sapriel, J., 1.6, 3.3, 3.4
 Sauvage, M., 3.3
 Savary, H., 3.1
 Sawada, A., 3.3
 Sawai, H., 1.11
 Sawatzky, G., 1.11
 Saxena, S. K., 1.4
 Scagnoli, V., 1.11
 Schaskolsky, M., 3.3

AUTHOR INDEX

- Scheerschmidt, K., 3.3
 Schefer, J., 1.5
 Scheffen-Lauenroth, T., 3.3
 Scheidt, M., 1.7
 Schell, A. J., 1.7
 Scherf, Ch., 3.3
 Scheringer, C., 1.9
 Scherrer, P., 3.2
 Schierle, E., 1.11
 Schiller, S., 1.7
 Schlenker, J. L., 1.4, 3.4
 Schlenker, M., 1.5
 Schlüter, M., 2.2
 Schmahl, W. W., 3.3
 Schmelzer, U., 2.1
 Schmid, H., 1.5, 3.3, 3.4
 Schmidt, C., 3.3
 Schmidt, V. H., 3.1
 Schnick, J., 3.1
 Schober, H. R., 2.1
 Schobinger-Papamantellos, P., 1.10
 Schoen, P. E., 2.4
 Schranz, W., 3.4
 Schroeder, P. A., 1.8
 Schubnikow, A., 3.3
 Schulz, H., 1.9
 Schulz, H. H., 1.9
 Schulze, W. A., 1.5
 Schütz, G., 1.11
 Schwartz, L., 1.1, 1.7
 Schwarz, K., 2.2
 Schwarzenberger, R. L. E., 1.5
 Scott, B. A., 1.3
 Scott, J., 3.4
 Scott, J. F., 3.1
 Scott, K. M., 3.3
 Scott, R. A. M., 1.5
 Seideman, T., 1.11
 Seifert, H., 3.3
 Seitz, F., 2.2
 Seki, H., 3.1
 Semenchev, A. F., 3.4
 Semenov, V. A., 1.5
 Sen, J., 2.4
 Senba, Y., 1.11
 Senechal, M., 1.10, 3.3
 Sette, F., 1.11, 2.4
 Sham, L. J., 2.2
 Shannon, R. D., 3.1
 Shapiro, S. M., 3.1
 Sharma, P. A., 1.5
 Sharp, R. T., 3.1
 Shaskol'skaya, M. P., 1.1, 1.5, 1.11, 3.1, 3.4
 Shawabkeh, A., 3.1
 Shchurov, V. A., 1.5
 Shechtman, D., 1.10
 Sheka, E. F., 2.1
 Shekhtman, V. Sh., 3.3, 3.4
 Sheldrick, G. M., 3.3
 Shen, G., 1.4
 Shen, H., 3.1
 Shen, Y. R., 1.7
 Sher, E. S., 1.5
 Shimada, Y., 1.11
 Shin, H. J., 1.11
 Shin, S., 1.11
 Shinnaka, Y., 3.1
 Shintani, H., 1.5
 Shirane, G., 1.6, 3.3, 3.4
 Shishkin, E. I., 3.4
 Shmueli, U., 1.9
 Shmyt'ko, I. M., 3.4
 Shortley, G. H., 2.2
 Shternberg, A. A., 3.2
 Shtukenberg, A. G., 3.3
 Shubnikov, A. V., 1.5, 3.2, 3.4
 Shur, M. S., 3.4
 Shur, V. Ya., 3.4
 Shuvalov, L. A., 1.1, 1.5, 1.7, 3.1, 3.2, 3.3, 3.4
 Sh vindlerman, L. S., 3.2, 3.3
 Shvydko, Yu. V., 3.3
 Sibbett, W., 1.7
 Sidorkin, A. S., 3.4
 Siegman, A. E., 1.7
 Siegman, E., 1.7
 Sierra, J., 1.8
 Sievers, A. J., 1.8
 Sigelle, M., 1.7
 Singh, D. J., 2.2
 Singh, K. K., 3.3
 Singh, S., 1.7
 Siny, I. G., 3.1
 Sirotin, Yu. I., 1.1, 1.5, 1.9, 1.11, 3.1, 3.4
 Sitnik, T. K., 3.3
 Sivia, D. S., 1.11
 Sizmann, A., 1.7
 Skinner, D. P. Jr., 3.4
 Skliar, A., 1.7, 3.4
 Skriver, H. L., 2.2
 Slack, G. A., 1.8
 Slater, J. C., 2.2
 Sleight, A. W., 1.4
 Smirnov, G. V., 3.3
 Smirnova, T. S., 1.5
 Smith, D. J., 3.3
 Smith, J. V., 3.3
 Smith, R. G., 1.7
 Smith, V. H. Jr., 1.9
 Smolenskii, G. A., 1.5, 3.4
 Smolensky, G. A., 3.1
 Smoluchowski, R., 2.2
 Smutný, F., 3.3, 3.4
 Snoeck, E., 3.4
 Snyder, G. J., 1.8
 Socolar, J. E. S., 1.10
 Sollier, A., 1.11
 Soltwisch, V., 1.11
 Song, C., 1.11
 Sonin, E. B., 3.4
 Sorantin, P. I., 2.2
 Sosnovska, I., 1.5
 Souptel, D., 1.11
 Spaldin, N. A., 1.5
 Sparks, C. J., 1.11
 Speiser, A., 3.2
 Spencer, E. G., 3.1
 Spitzer, D. P., 1.8
 Springborg, M., 2.2
 Srinivasan, R., 1.4
 Srivastava, G. P., 2.1
 Stadnicka, K., 1.6
 Stalder, E. W., 1.5
 Statz, H., 3.1
 Staub, U., 1.11
 Steichele, E., 1.5
 Stein-Arsic, M., 2.1
 Steinhardt, P. J., 1.10
 Stern, E. A., 1.11
 Stoicheff, B. P., 2.4
 Stokes, H. T., 1.2, 3.1, 3.4
 Stolypin, Yu. E., 1.5
 Stössel, H., 1.5
 Stothard, D. J. M., 1.7
 Stout, J. W., 1.5
 Strange, P., 1.11
 Stratovich, R. L., 1.9
 Strauch, D., 2.1
 Straumal, B., 3.3
 Strempfer, J., 1.11
 Strobl, H., 3.3
 Strukov, B. A., 3.1, 3.4
 Strunz, H., 3.3
 Stuart, A., 1.6
 Stull, J. L., 1.5
 Stunault, A., 1.11
 Subbotin, A. L., 3.4
 Subías, G., 1.11
 Suck, J.-B., 2.4
 Sugihashi, A., 1.7
 Sukhorukov, A. P., 1.7
 Sun, D., 3.1
 Sunagawa, I., 3.3
 Sussner, H., 2.4
 Sutter, H., 3.2
 Sutton, A. P., 3.2, 3.3, 3.4
 Suzuki, Y., 1.11
 Sweegers, C., 3.3
 Swihart, J. C., 1.8
 Syromiatnikov, V. N., 1.5, 3.1
 Szivesy, G., 1.6
 Tagancev, A. K., 3.4
 Tagancev, A. R., 3.4
 Tagantsev, A. K., 3.3
 Taguchi, Y., 1.11
 Tahvonen, P. E., 3.1
 Takahashi, H., 1.7
 Takahashi, T., 3.1
 Takano, Y., 3.3
 Takata, Y., 1.11
 Takeda, H., 3.3
 Takeuchi, T., 1.11
 Takeuchi, Y., 3.3
 Tamazyan, R., 3.3
 Tanaka, M., 1.11
 Tanaka, Y., 1.11
 Tang, C. C., 1.11
 Tang, C. L., 1.7
 Taniuchi, T., 1.7
 Tanner, B. K., 3.3
 Tarkhova, T. N., 1.5
 Tasci, E. S., 1.5
 Tatsuzaki, I., 3.4
 Tayger, B. A., 1.5
 Taylor, C. A., 3.3
 Taylor, P. L., 1.8
 Taylor, R., 1.8
 Tebbutt, I. J., 1.6
 Templeton, D. H., 1.11
 Templeton, L. K., 1.11
 Teng, M. K., 3.1
 Terakura, K., 2.2
 Tertsch, H., 3.2, 3.3
 Thiers, A., 1.2
 Thiessen, P. A., 3.2
 Thole, B. T., 1.11
 Thomas, L. A., 3.3
 Thomas, R. L., 1.8
 Thompson, P., 1.11
 Thro, P. Y., 1.7
 Thurmond, C. D., 1.7
 Thurston, R. N., 1.3
 Thust, A., 3.3
 Tichý, J., 3.4
 Tikhonov, V. I., 1.9
 Tohno, S., 3.3
 Tokunaga, M., 3.1
 Tokura, Y., 1.5, 1.11
 Tolédano, J.-C., 3.1, 3.4
 Tolédano, P., 3.1, 3.4
 Tomaszewski, P. E., 3.4
 Tomov, I. V., 1.7
 Tomura, S., 3.3
 Toner, J., 1.10
 Tonnerre, J.-M., 1.11
 Toupin, R., 1.3
 Townsend Smith, T., 1.5
 Toyoda, H., 3.3
 Trammell, G. T., 1.11
 Trampenau, J., 2.1
 Trickey, S. B., 2.2
 Trueblood, K. N., 1.9
 Truesdell, C., 1.3
 Tsatskis, I., 3.3
 Tschermak, G., 3.2, 3.3
 Tsuchimori, M., 3.3
 Tsuei, C. C., 1.8
 Tsuya, N., 1.5
 Turkovic, A., 3.1
 Turnbull, G. A., 1.7
 Turov, E. A., 1.5
 Turrell, G., 2.3
 Tzoar, N., 1.11
 Uchino, K., 3.4
 Uehara, M., 1.11
 Umegaki, S., 1.7
 Underwood, F. A., 3.3
 Ungaretti, L., 3.3
 Unoki, H., 3.1
 Unschen, R., 1.7
 Vacher, R., 1.3, 2.4
 Vainshtein, B. K., 3.2, 3.4
 Vajk, O. P., 1.5
 Valasek, J., 3.2
 Valentine, P. C., 3.3
 Van Aken, B. B., 1.5
 Van Bueren, H. G., 3.3
 Van den Handel, J., 1.5
 Van der Laan, G., 1.11
 Van der Waals, J. D., 3.1
 Van Enckevort, W. J. P., 3.3
 Van Gelder, A. P., 1.8
 Van Kempen, H., 1.8
 Van Landuyt, J., 3.3, 3.4
 Van Tendeloo, G., 3.2, 3.3, 3.4
 Van Uitert, L. G., 1.7
 Vasileva, I. G., 3.3
 Vávra, I., 3.4
 Vecchini, C., 1.11
 Vedrinskii, R. V., 1.11
 Veenendaal, M. van, 1.11
 Velsko, S. P., 1.7
 Venetsev, Yu. N., 1.5
 Verger-Gaugry, J. L., 1.10
 Verhaegen, S. A. C., 3.3
 Vettier, C., 1.5, 1.11
 Vianden, R. J., 2.2
 Villevall, P., 1.7
 Viret, M., 1.5
 Vlachavas, D. S., 3.2, 3.4
 Vogt, C., 1.8
 Vogt, T., 1.4
 Voigt, W., 1.1, 1.3, 1.5
 Volkel, G., 3.1
 Volkov, A. A., 3.1
 Von der Muhl, R., 3.1
 Von Hippel, A., 3.2
 Vosko, S. H., 2.1, 2.2
 Wadati, H., 1.11
 Wadhawan, V. K., 3.1, 3.2, 3.3, 3.4
 Waerden, B. L. van der, 1.5
 Wagin, S. V., 3.3, 3.4
 Wagner, W., 1.11
 Wahlstrom, E. E., 1.6
 Wakabayashi, Y., 1.11
 Walker, E., 3.3, 3.4
 Walker, H. C., 1.11
 Walker, M. B., 3.4
 Wallace, C. A., 3.3
 Wallace, D. C., 1.3
 Wallenstein, R., 1.7
 Wang, R.-H., 1.10
 Wang, X., 1.11
 Wang, Y., 3.1
 Wang, Y. N., 3.4
 Wang, Y. Q., 1.5
 Wang, Z., 1.8
 Warhanek, H., 3.4
 Warner, J., 1.7
 Warren, J. L., 2.1
 Watkin, D. J., 3.3
 Weber, H. J., 2.1
 Weertman, J., 3.3
 Weertman, J. R., 3.3
 Wei, L., 1.8
 Weigel, D., 1.10
 Weinert, M., 2.2
 Weinreich, G., 1.7
 Weiss, Chr. S., 3.2
 Weiss, G. H., 2.1
 Weiss, P., 3.1, 3.2
 Weitzenböck, R., 3.1
 Wenk, H.-R., 3.3
 Wermeille, D., 1.11
 Weschke, E., 1.11
 Western, A. B., 3.1
 Weyl, H., 3.1
 Wheeler, R. E., 3.1
 White, E. A. D., 3.3
 White, G. K., 1.4
 White, J. S., 1.5

AUTHOR INDEX

- White, R. L., 1.5
 Wiedemann, G., 1.8
 Wigner, E., 2.2
 Wijn, H. P. J., 1.5
 Wilber, S. A., 3.1
 Wilhelm, F., 1.11
 Wilhelm, W., 1.11
 Wilk, L., 2.2
 Wilkins, S. B., 1.11
 Williams, A. R., 2.2
 Williams, L., 3.3
 Willis, B. T. M., 1.9
 Winchell, A. N., 1.6
 Windsch, W., 3.1
 Winkler, B., 2.2
 Winternitz, P., 3.1
 Wiser, N., 1.8
 Wolf, E., 1.6, 2.4
 Wolf, Th., 3.3
 Wondratschek, H., 1.9, 3.2, 3.3,
 3.4
 Wondre, F. R., 3.1
- Wood, G. J., 3.3
 Wood, I. G., 1.6
 Woods, G. L., 1.7
 Wooster, W. A., 1.1, 3.3
 Worlock, J. M., 3.1
 Worlton, T. G., 2.1
 Wright, D. C., 1.11
 Wrinch, D., 3.3
 Wruck, B., 3.3
 Wu, J. W., 1.8
 Wunderlich, W., 3.3
 Wyder, P., 1.8
- Xu, Y., 3.4
 Xu, Z., 3.1
- Yakhou, F., 1.11
 Yamada, T., 3.3
 Yamamoto, A., 1.10
 Yamamoto, E., 1.11
 Yamasaki, Y., 1.5, 1.11
 Yang, S. T., 1.7
- Yang, W.-G., 1.10
 Yangui, B., 3.3
 Yao, J. Q., 1.7
 Yao, T., 1.8
 Yariv, A., 1.6, 1.7
 Yavelov, B. E., 1.5
 Yeh, P., 1.6, 1.7
 Yin, J., 3.4
 Youden, J. P. A., 2.4
 Yu, Z., 3.1
 Yudin, V. M., 1.5
 Yvon, K., 3.3, 3.4
- Zaccaro, J., 1.7
 Zadorozhni, V. I., 1.7
 Zaharko, O., 1.5
 Zaitsev, V. M., 1.5
 Zalessky, A. V., 1.5
 Zamorzaev, A. M., 1.5
 Zarembowitch, A., 1.3
 Zarembowitch, J., 1.3
 Zeller, R., 1.11, 2.2
- Zhang, C. L., 1.5
 Zhang, M.-S., 3.1
 Zhang, Z., 3.1
 Zhdanov, G. S., 1.5
 Zheludev, I. S., 1.1, 3.2, 3.3,
 3.4
 Zhitomirsky, I. D., 1.5
 Zhu, J., 3.1
 Zhu, J. S., 3.4
 Zieliński, P., 3.4
 Zikmund, Z., 3.3, 3.4
 Ziman, J. M., 1.8
 Zinserling, K., 3.3
 Zondy, J. J., 1.7
 Zorin, I. A., 1.5
 Zorin, R. V., 1.5
 Zucker, U. H., 1.9
 Zvezdin, A. K., 1.5
 Zvirgzds, J. A., 3.1
 Zwicker, B., 3.2
 Zyss, J., 1.7
 Zysset, B., 1.7

Subject index

- Ab initio* calculations 104, 291, 311, 319, 322
 ABDP and Kleinmann symmetries **184**, 191
 Absorption colours 169
 ABX_3 structure type 439
 A_2BX_4 structure type 439
 Acceptance bandwidths 200–202, 204, 207, 215
 angular 201–203, 211, 215
 spectral 203, 211, 215
 thermal 203, 215
 Accidental degeneracy 306, 318
 Acoustic activity 14
 Acoustic branches **102**, 225, **289**, 292, 308, 335
 Acoustic modes 225, 227, **288**, 292, 337, 504
 Acoustic phonons 91, **226–228**, 290, 302, 334, 346, 349
 Acousto-optic effect 3, **178**, *see also* elasto-optic effect
 linear 153, 155
 Acousto-optic interaction 386
 Acousto-optic materials 155, 178–179
 figure of merit 179
 Actinide elements 107
 Active representation 379
 Acute bisectrix figure **165–167**, 168
 Adiabatic coefficients 32
 Aggregates 384, 398, **413**, 415, 456, 464, 467, 507
 twin 417–418, 420, 422
 Aizu classification 128, **491**, 497
 Aizu notation 452–453
 Aizu species 128, 452–453, 495
 Albite ($\text{NaAlSi}_3\text{O}_8$) 423, 434, 437, 444, 464, 466
 growth twin 419
 twin law 433–434, 453, 470
 Alkali metals 224, 227
 Allotwins 418, 450
 AlMn alloys 247, 453
 Alternative twin operations **420**, 423, 426–431
 Aluminium 84, 89
 Amethyst 454, 459
 Ammonium lithium sulfate (NH_4LiSO_4) 417, 425, 436, 448, 455–456, 458, 476
 Ammonium sulfate [$(\text{NH}_4)_2\text{SO}_4$] 440
 Analyser **157**, 158–160, 162–164, 273, 275, 335, 519
 Analyser plane 159
 Anatase (TiO_2) 277–278, 418, 458, 461–462
 to rutile phase transition 462
 Angular phase **132**, 138
 Anharmonic deformation density 242
 Anharmonic interactions 227, **228**
 Anharmonic potentials 90–91, 104
 Anharmonicity 80, 101, 231, 286, **292**, 383
 Anisotropy 156, 169, 187, 202, 269, 271, 274, 279, 327, 329–330, 414, 533
 magnetic 108, 120–121, 125–126, 129–133, 139–141, 145, 147, 148
 optical 156
 X-ray 269
 Anisotropy energy **120–121**, 126–127, 129, 132–133, 145, 148
 Anisotropy factor 83–84
 Annealing twins 438, 443
 Anomalous dispersion 187
 Anomalous scattering 269, 425, 469, 471
 Antibonding states 326, 329
 Anticrossing 306
 Antiferromagnetic crystals 106, 133
 Antiferromagnetic domains 127–128, 138–139
 Antiferromagnetic ferroelectrics 107, 131, 143–144
 Antiferromagnetic helical structure **110**, 123
 Antiferromagnetic order 116, 123, 128, 131, 144–145
 Antiferromagnetic phase 90, **118–119**, 126, 130–131, 143
 Antiferromagnetic structure 106, **110**, 116, 119–120, 124, 128–130, 132–133, 144, 326
 Antiferromagnetic vector 106, 119–121, 123–128, 131–133, 137–138, 140–141, 144–145, 147
 Antiferromagnetism 110, 117, 143
 Antiferromagnets **106**, 108–111, 117–118, 121, 123, 125, 127–134, 136–139, 142–143, 145
 non-collinear 106, 123
 nuclear 110
 Antiferromagnets
 uniaxial 124–126, 138
 Antiphase boundaries 414, 418, 438, 458, 469
 Antiphase domains 414, 438, 458, 503
 Anti-Stokes process 336–337, 347, 350
 Antisymmetric pseudotensor, third-rank 344
 Antisymmetric tensors 9–10, **13–14**, 29, 38, 42, 51, 68, 171, 257, *see also* axial tensors
 rank 2 278
 rank 3 14, 70, 171, 277
 rank 3 (unit) 171
 Antisymmetry groups 110, 508
 Approximate lattice coincidence, *see* pseudo-coincidence
 Aragonite (CaCO_3) 156, 417–419, 431, 433, 444, 448, 450, 453, 457, 459, 464, 475
 Aristotype 439, 449
 Arrott–Belov–Kouvel plots 124
 Arrowhead twin 419
 Asymmetry parameter 328
 Atom transformation table 296, 298–299
 Atomic displacement 141, 231–232, 271, 286, 290, 294, 301, 304, 335, 369
 contribution to Raman tensor 341, 345–346
 ellipsoid (*ORTEP* ellipsoid) 242
 parameters (ADPs) 231–232, 269
 tensors 232, 235, 242
 vector 231
 Atomic level 319
 Atomic orbitals 319, **321**, 325
 Atomic sphere approximation 319, 322
Aufbau principle 320
 Augmented plane wave (APW) 322, *see also* linearized augmented plane wave (LAPW)
 Axial force 342
 Axial plane **157**, 163, 166–169
 Axial scalar 14
 Axial tensors 5, 10, **13–14**, 24, 29–30, 51, 134, 140, 171, 342, 380, *see also* pseudotensors
 time-antisymmetric 138
 Axial vectors 3, **10**, 12–13, 51, 107, 113, 122, 140, 171, 338, 344, *see also* pseudovectors
 Babinet compensator 163
 Back focal plane 157, 164
 Backscattering 351, 353
 geometry 335
 Band index 252–253, 318–319
 Band structure 223, 311, 314, **325**, 330, 332
 Band theory 326
 Barium boron oxide (BBO) (BaB_2O_4) 192, 213
 Barium gallate (BaGa_2O_4) 484
 Barium manganese tetrafluoride (BaMnF_4) 386
 Barium sodium niobate ($\text{Ba}_2\text{NaNb}_5\text{O}_{15}$) 209, 217, 387
 Barium titanate (BaTiO_3) 177, 359, 381, 383, 397, 424, 435–436, 462–463, 467, 484, 492, 527
 Basic structure, *see* aristotype
 Baveno twin 457
 Becke line **159**, 164
 Benzil [$(\text{C}_6\text{H}_5\text{CO})_2$] 446
 Berek compensator 163
 Berlinite (AlPO_4) 274, 428
 Bertrand lens **157**, 164
 Biaxial classes **163**, 168, 188–189, 197–199, 203
 Biaxial crystals **157**, 159, 163, 165, 168–169, 188–190, 192, 196–197, 199, 202–204, 215
 negative 157, 189, 194–195, 202
 positive 157, 189, 194–195, 202
 Biaxial figure 165–168
 Biaxial indicatrix **157**, 176, 179
 Biaxial medium 11
 Bicrystallography **398–399**, 438, 441, 468, 485, 506, 509, 529, 531–532
 Bicrystals **398–399**, 413, 415, 417, 441, 463, 468–469, 529, 532
 Bilinear forms 7–8, 13, 74, 81
 Biot–Fresnel construction 165–166
 Biotite 159, 169
 Birefringence 3, **155–170**, 176–178, 188–189, 191–192, 202, 213–214, 218, 269, 335, 350–351, 387, 414, 424–425
 circular 170, 173
 determination of 160, 163
 linear 139, 153, **156–157**, 163, 170, 173, 175, 177
 magnetic, *see* Cotton–Mouton effect
 strain or stress 3, 177
 Bismuth iron oxide (BiFeO_3) 145
 Black and white symmetry groups 110–111, 142–143, 251, 398, 404, 420, 422, **423**, 426–427, 453–454, *see also* antisymmetry groups, colour symmetry
 Bloch condition 316–317
 Bloch function 315–317, **319**, 321, 323, 325–326
 Bloch states 316–319, 325
 Bloch theorem **315**, 326
 Bloch wall 538
 Bloch waves 301
 Block-diagonal form 302, 304
 Body forces 76, 95
 Bonding character 326
 Bonding states 326, 329
 Boracite 131, 141, 143–144
 Born–Oppenheimer approximation 322
 Born–von Karman boundary conditions, *see* periodic boundary conditions
 Bose factor 291, 293
 Bose–Einstein factor 101, 224, 336
 Boundary contrast 425, 458
 Boundary dislocations 467
 Boundary energy **437**, 446, 450, 457, 463, 467
 minimization 418, 457
 Boundary scattering 225, 227
 Bravais lattices 114, 269–271, **314**, 318, 360, 367, 381, 447
 magnetic 106, 114–117, 122, 131, 142
 Brazil twins 419, 424, **427–429**, 436–437, 440, 446–447, 454, 456, 459, 469
 Brillouin scattering 88, 337, 346, **349–355**
 Brillouin zone **47–50**, 62, 65, 308–310, **314**, **318**, 337, 347, 381–382
 boundary 48, 288, 296–297, 302, 308–309
 symmetry of 318
 Brookite (TiO_2) 418, 461
 Brugger constants 93
 Brugger stiffness coefficients 93
 Bulk modulus 83
 Burgers vector 467–468
 Burnside’s theorem 39
 Butterfly twin 419
 Cadmium sulfide (CdS) 94, 226
 Cadmium telluride (CdTe) 429, 438, 446, 456
 Calcite (CaCO_3) 84, 100, 104, 156, 158–159, 163–164, 419, 423, 429, 436, 439–440, 442, 445–446, 453–454, 465, 468
 Calcium gadolinium borate [$\text{CaGd}_4(\text{BO}_3)_3\text{O}$] 217
 Calomel (Hg_2Cl_2) 504, 528, 538–539
 Capacitance method 103, **104**
 Car–Parrinello method 322
 Carlsbad twins 419, 453, 464
 Cartesian coordinates 92, 134, 140, 186, 235, 253, 303, 324–325, 335, 344, 371, 378–379, 381, 488, 493, 495–496, 512, 526–527, 538
 Cartesian product 400
 Cartesian tensors **51**, 253, 278–279, 342, 371, 379–380, 394, 493–494, 509, 515
 Cassiterite (SnO_2) 419, 462
 Cauchy relations 77, 82
 Cell twinning 417, 469
 Ceramics 398, 413, 464, 467
 Chalcopyrite 439
 Character tables **40–41**, 44–45, **56–60**, 66–68, 255–256, 260, 303, 311, 393
 for quasicrystals 260
 Characters **39–44**, 46, 51, 54, 56–57, 62, 64, 66–69, 113, 251, 253, 256, 302, 308–311
 Charge density 106, 117, 322–325, 327–329, 455–456
 nuclear 328
 Charged boundaries 455–456

SUBJECT INDEX

- Chemical bonding 269, 319, 321, 325, 331, 446
 Chirality 169–170, 274, 372, 380
 Chirality relation 415
 Christoffel determinant 86–88
 Christoffel matrix 86–87
 Chromium oxide (Cr_2O_3) 118, 132, 140–141
 Circular birefringence 170, 173
 Circular dichroism 170, 269–270
 Circular polarization 172–173, 273
 Circularly polarized light **163**, 169–170, 173, 175
 left 169, 173
 right 169, 172–173
 Circularly polarized radiation
 left 273
 right 273
 Clamping 467
 Class multiplication constants 40
 Class multiplication table 40, 393
 Class structure 393
 Clebsch–Gordan coefficients 52–53, 392
 Clebsch–Gordan products 392–393
 Cobalt 127, 132, 145, 148
 Co-elastic twins 440
 Coherence
 of grain boundaries 468
 of twin boundaries 468–469
 Coherence length **191**, 196, 201, 215, 217, 246
 Coherent domain walls **486**, 521, 527–529
 Coherent interface 468–469
 Coincidence 441
 Coincidence lattice 442, 446, 448, 450, 472–474
 index 441–442, 448
 three-dimensional 446
 Coincidence-site lattice (CSL) **399**, 413, 418, 428, 441–442, 447, 470
 Coincidence-site sublattice 441, 454
 Coincidence-site subset 441
 Coincidence sublattice 442–443
 Colour-changing operations 423, 529
 Colour-preserving operations 423, 508, 529
 Colour symmetry 110, 423, *see also* black and white symmetry groups, dichromatic groups
 Commutator group 41
 Compatibility relations 286, **309**, 318, 325, 330, 337, 341, 343, 461
 Compatible planes 451
 Compensating gauge transformations 252
 Compensator
 Babinet 163
 Berek 163
 Ehringhaus 163
 Sénarmont 163
 Complete twin 422, 428, **436**, 497
 Complex twin 416, 441, 470
 Component state, *see* orientation state
 Composite groups 423
 Composite pseudosymmetry 432
 Composite symmetry **419–423**, 425–429, 431, 434–435, 448, 450, 452–453, 472, 477, 509
 classification 421
 crystallographic 421–422, 427, 431
 extended 422, 431–432, 434
 noncrystallographic 422, 427, 439
 pseudo-crystallographic 422
 reduced 421–422, 427–428, 430–435, 439, 452–454, 473–474
 Composition plane 415, **417–420**, 423, 428–429, 431–435, 441, 443–444, 450, 452–457, 459, 463, 468–469
 Compressibility 292
 isothermal 293
 linear 83
 volume 83, 101, 104
 Condenser **157**, 160, 163
 Conductivity
 electrical 5, **223**, 225–227, 229, 387, 390, 447, 455
 ionic 390
 metallic 326
 thermal 5, 9, 13, 223, **227–229**
 Conjugate subgroups 39, 376, 379, 392–394, 399, 401, **403**, 406–409
 Conoscopic configuration 157–158, **163–165**
 Constraints 303
 Contact plane 417–419, 421, 429, 432, 434, 438, 450–451, 453, 457, 461, 463, 465, 469
 Contact plane
 initial 438
 Contact relations 398, 415, 417, 450, 459, 469
 Contact twins 397, 418, **419**, 423, 428–429, 437–438, 442, 446
 Contracted product **8**, 9–10, 14, 24, 26
 Contraction **8**, 181, 185, 191, 196, 198, 232
 Contragredient 38
 Contravariant 5–9, 13, 231–232, 270, *see also* contragredient
 Conversion efficiency **200**, 201, 203–211, 213–215, 217
 Conversion equations 372, 380, 394, 493–494, 509
 Copper 318, 326, **330**, 332, 463
 Cordierite ($\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18}$) 466–467
 Core electrons 317, 322, 325–326
 spectra 332
 Co-representations 55
 Corundum (Al_2O_3) 141, 157, 429, 450
 Coset composition 419
 Coset decomposition 400, 403–404, 408–410, 419–420, 427, 489, 503, 509, 511–512, 528, 531
 Cosets 35, 46, 48, 53–55, 118, 297, **402–404**, 408–410, 419–423, 426–431, 434, 447–450, 452–453, 489–490, 503–509, 531, *see also* double cosets
 Cotton–Mouton effect 138, 153, 155, *see also* magnetic birefringence
 Coulomb energy 320
 Coulomb interaction 225
 Coulomb potential 319–321, 329, 457
 Coulomb repulsion 326
 Coulombic term 383, 388
 Covariance 9–10, 242
 Covariant **5–10**, 13, 231–232, 242, 270, 371–372, 380, *see also* tensorial covariants
 Critical phenomena 360
 Critical point 347
 Critical temperature 88, 90, 132
 60° Cross 435, 448–449, *see also* St Andrew's cross
 90° Cross 434–435, 448–449, 453, *see also* Greek cross
 Cross wires 158, 164
 Crossed polars (Nicol's) 159–161, 163, 169, 177, 414, 424, 436, 465–466, 484
 Crystal anisotropy 279
 Crystal family 439–440, 442, 447, 450, 471, 491, 512, 515–516
 hexagonal 470, 473
 Crystal-field effects 331
 Crystal-field splitting 143
 Crystal harmonics 323–324, 328, 331
 Crystal optics 155
 classical 153
 Crystal system 440, 450
 CuAu alloys 247
 Cubic dilatation 72–73, 75–76, 83
 Cumulants 231, **232**
 Curie laws 4, **11**, 84, 108
 Curie principle 414
 Curie temperature 124, 367, 382–383, 387–389, 392, 397, 447
 Curie–Weiss law 107–108, 143
 Current density 14, 106, 223, 227
 Cyclic twins 417–418, **419**, 422, 432, 453, 464, 475
 eightfold 432
 fivefold 443, 463
 sixfold 432
 Cylindrical symmetry 11
 Daughter phase **398**, 427, 438–439, 451–452, 455, 465–466
 Dauphiné twins 419, 424, 427–429, 436–440, 444, 446–447, 454, 456–457, 459, 461, 515
 Dauphiné–Brazil twins 428–429
 Debye frequency 292
 Debye model 90, 102, 226, **292**
 Debye temperature 89–90, 224, 227–228, **292**
 Debye theory 102, 227
 Debye–Waller factor 231, 235, 242, 278
 static 231
 thermal 231
 Debye–Waller temperature 231
 Deformation twins 419, **439**, 443, 445, 453–455, 464–468, *see also* mechanical twins
 Σ3 439–440
- Degeneracy 56, 212–214, 303, 337, 360, 363, 366
 accidental 306, 318
 of domain states 490–492, 497, 504, 510
 of lattice vibrations 306
 time-reversal 306, 309
 Degenerate eigenvalues 294, 301–302
 Degenerate lattice vibrations 306
 Degenerate modes 309
 Degenerate phonon branches 288
 Degenerate phonon modes 294, 301, 308
 Degenerate phonons 302–303, 305–306
 Demagnetizing field 127
 Density functional theory (DFT) 314, 319–323, 325–326, 328
 Density of states (DOS) 229–230, 291–292, 326, 332, 347
 Depolarization 188
 Detwinning **440**, 484–485, 515, *see also* switching
 Dextrorotation 169–171
 Dextrorotatory solution 172
 Diamagnetic susceptibility 107–108
 Diamagnets **106–108**, 111, 117, 134, 140, 142
 Diamond 82–83, 94, 104, 163, 227–228, 358, 418–419, 423, 429
 Dichalcogenides $M\text{e}X_2$ 439, 449
 Dichroism 169
 circular 170, 269–270
 linear 170
 magnetic linear 270, 278
 magnetochiral 270, 276
 Dichromatic complex 399, **506**, 529, 531–532
 Dichromatic groups 398–399, **404**, 423, 497, 506, 508, 521, 529, *see also* black and white symmetry groups
 Dichromatic pattern 399
 Dielectric constant 3–5, 8–9, **13**, 31, 154, 387, *see also* dielectric permittivity
 Dielectric displacement 155, 171, 187
 Dielectric impermeability 8, 26, 175–177
 relative 157
 Dielectric impermeability tensor 157, 175, 178
 Dielectric materials 435
 Dielectric permittivity 138, 142, 360, 380, 485, *see also* dielectric constant
 Dielectric (or electric) polarization **3**, 4, 8, 11–12, 31, 54, 139–140, 142, 153, **154**, 181, 335–336, 359–360, 369, 371–372
 spontaneous, *see* spontaneous polarization
 third-order 181
 Dielectric susceptibility 3–4, 144, 154, 156, 181, 184–185, 259, 269, 334, 343, 362–364, 367, 369, 371, *see also* susceptibility
 higher order 153, 155, 185
 linear 182–183, 334, 343, 345
 magnetic field dependence 142
 nth order 183–184
 nonlinear 182–183, 334, 336
 positive 195
 second-order 183–184, 336–337
 tensor, *see* dielectric tensor
 X-ray 269
 Dielectric tensor 38, 42, **155–157**, 170–171, 181, 185–186, 190, 196, 198–199, 277, 341, 344, 349–350
 effective 170–171
 effective, symmetry of 171
 second-order 181
 third-order 181
 Difference-frequency generation (DFG) 181, 191–192, 200, **211**
 Differential cross section 335–336, 347
 Diffraction experiments 376
 Diffraction pattern 246–250
 of a twinned crystal 420, 435, 441, 448, 469–471, 475–477
 Diffraction theory 278
 Diffuse scattering 369, 466
 Diperiodic twins **441**, 446, 450
 Dipole–dipole interaction 275
 Dipole–quadrupole atomic factor 276
 Dipole–quadrupole interaction 275
 Dipole–quadrupole tensor atomic factor 280
 Dipole–quadrupole tensors 277
 Direct inspection method 14, **16**, 18, 20
 Dirichlet construction 314
 Dirichlet domain or region 46, 314

SUBJECT INDEX

- Discommensurations 532, 534
 Dislocation arrays 399
 Dislocation node 468
 Dislocation reactions 468
 Dislocations 80, 223, 227, 424–425, 438, 468, 527
 perfect 467–468
 stair-rod 459
 twinning 454, 467–468
 Dispersion 102, 159, **169**, 187, 191–192, 203, 213–214, 269, 275, 319, 325
 birefringent 170
 directional 341–342
 optical rotatory 170
 phonon 288–291, 301, 310–311
 spatial 170–171, 342–343, 345–346
 spectral 201
 X-ray anomalous 170
 Dispersion branches 289
 Dispersion corrections 269, 274
 Dispersion curves 288, **290**, 306, 341, 347
 Dispersion relation 229, 334
 Dispersion surface 301
 Displacive modulation 246–248
 Dissymmetrization 398–399, 402, 485, 487, 489, *see also* symmetry descent
 Distorted phase 383, 398, 451
 Domain boundary 177, 415, 417, 425, 450, 452, 455, 459
 Domain pairs 400, 410, 421–423, 443, 477, 486, 497, **505–528**, 531–532, 535
 antiphase 528
 elasto-optic 515
 electro-optic 515
 electrostrictive 515
 ferroelastic 486, **497**, 505–507, 510, 512, 515, 517–518, 521, 526–528, 535
 ferroelectric 510, 515, 527
 gyrotropic 515
 microscopic description 528
 non-ferroelastic 486, 497, **505**, 507, 509, 511–515, 527–528, 533
 piezoelectric 515
 Domain states 372, 378–381, 392–394, 400, 403, 406–408, 410, 415, 464, **486–505**, 506–512, 515, 521, 526–527, *see also* orientation state
 disoriented 518–521
 ferroelastic 371, 376, 484, 486, **487**, 488, 490–492, 497, 504, 506, 516–517, 519–521, 527–528
 ferroelectric 371, 376, 380, 397, 486, **487**, 492, 497, 527
 ferroic **371**, 375–376, 378, 487, 491, 493, 495, 505, 510
 in magnetic materials 137–138, 141, 145, 147
 non-ferroelastic 486, **491–492**, 505
 non-ferroelectric 492
 single 398, 496, 526
 tensor distinction 375
 Domain structures 392, **397–412**, 417–418, 477, **484–543**
 ferroelastic 440, **484**, 486, 491, 520
 ferroelectric 397–398, 425, **484**, 486–487, 533
 ferroic **485–486**, 488
 in magnetic materials 126, 128, 506
 in magnetoelectric materials 506
 non-ferroelastic 398, 440, **484**, 488, 491
 pyroelectric 425
 Domain switching, *see* switching
 Domain texture 440, 534
 Domain twins 399–400, 404, 477, 486–487, 497, **505–507**, 518–521, 526–533, 535
 ferroelastic 486, **497**, 506, 518, 520–521, 527, 535–536, 539
 non-ferroelastic 486, **497**, 506, 512, 533
 Domain walls 397, 399, 450–451, 453, 458, 484, 486, 505–506, 518–521, 526–527, **528–539**
 coherent **486**, 521, 527–529
 ferroelastic 484, 486, **527–528**, 535–536, 538–539
 in magnetic materials 126–128
 non-ferroelastic 484, 486, **533**, 536
 Domains 477
 180° 106, 126–128, 140
 antiferromagnetic 127–128, 138–139
 antiphase 414, 438, 458, 503
 anti-polar 455
 Domains 477
 180° 106, 126–128, 140
 antiferromagnetic 127–128, 138–139
 antiphase 414, 438, 458, 503
 anti-polar 455
 Domains
 ferroelastic 128, 360, 398, 406, 435, 440, 450–451, 484, 518–519
 ferroelectric 128, 388, 398, 425, 435–436, 447, 484–485, 487
 ferroic 128, **398**, 406, 410, 488
 ferromagnetic 128, 397, 485
 needle **465**, 468
 S- 127–128, 137, 140
 T-, *see* twin domains
 Doppler shift 328
 Double cosets 394, 399, 401, 404, 410, 489, 497, 511–512, 528
 Double groups **45**, 50, 55, 61–62
 Double refraction 11, 156, **158**, 160, 181, 187–188, 190, 196
 Double-refraction angle 187–188, 190, *see also* walk-off
 Double space groups 50
 Dovetail twins 417, **419–421**, 426–427, 437–438, 445–446, 451, 453, 457, 464, 470
 Druckzwillinge 439, *see also* mechanical twins
 Dual basis 6–7, 47
 Dual lattice 62
 Dual space 6, 9, 37–38
 Dual vectors 38
 Dummy index 4, 13, 31, 72, 81
 Dynamic elasticity, nonlinear 95
 Dynamical matrix 86, **286–288**, 290, 294–306, 308, 311, 335, 341, 343
 block-diagonalized 304
 eigenvalues 288, 294
 eigenvectors 288, 294, 301
 symmetry constraints 296
 transformation law 295
 Dzyaloshinskii–Moriya interaction 130
 Easy-axis antiferromagnet 125, 130, 133
 Easy-axis ferromagnet 148
 Easy-axis magnet **121**, 126–129, 132
 Easy-plane magnet **121**, 126, 128–129, 132
 Edgeworth series 232, 235
 Effective charge matrix 335
 Effective charge tensor 338, 344
 Effective coefficient 191, **196**, 199–201, 204, 212, 216–217
 Ehringhaus compensator 163
 Eigen modes 184, 188, 190, 200, 341
 Eigensymmetry 406, 408, 418–434, 439, 447–448, 451–453, 455–456, 459, 470–472, 476–477, 488
 full 422, 428, 431, *see also* orientation state
 monoaxial 422
 monochromatic 423
 oriented 421–422, 426–427, 429
 reduced 428, 430–431
 Eigenvalues 73, 86–87, 97, 156, 172, 176, 287–290, 294, 301, 315–318, 321–322, 349
 degenerate 294, 301–302
 Eigenvectors 73–74, 79, 86–87, 97, 156, 172–173, 286, 288–291, 294, 301–308, 335, 349
 Einstein convention 4–5, 8, 72
 Einstein model 90, 226, 291
 Einstein temperature 292
 Elastic coefficients 81, 85, 349, 351, *see also* elastic stiffnesses
 in piezoelectric materials 351
 Elastic compliances 26–27, 31, 81–84, 146, 489, 514–515
 fourth-order 81
 second-order 93
 third-order 81
 Elastic constants 3–5, 13–14, 26, 67, 79, **81–83**, 86, 88, 93, 102, 104, 256, 258, 277, 290, 337, 350, 369, 485
 adiabatic 90
 dynamic 88
 fifth-order 91
 fourth-order 91
 frequency dependence of 88
 higher-order 91, 95, 98
 higher-order, measurement of 97
 in icosahedral quasicrystals 259–260
 in octagonal quasicrystals 257
 in quasiperiodic structures 256, 259
 isothermal 88, 90, 94
 Elastic constants
 measurement of 86, 88
 pressure dependence of 89–91
 second-order 93–94, 98
 static 88
 temperature dependence of 89–90
 third-order 81, 91, 94–95, 98
 third-order, measurement of 97
 Elastic energy 79, 145–146, 148, 256, 467
 Elastic limit 80
 Elastic moduli 81, 91, *see also* elastic compliances
 Elastic stiffnesses 3, 26–27, 32, **80–82**, 84, 86–87, 89, 91–92, 146–148, 177, 254, 290, 293, 308, 345, 514
 adiabatic 88
 dynamic 86
 fourth-order 81
 higher-order 93
 in piezoelectric media 350
 isentropic 93
 isothermal 88, 93
 pressure dependence of 89, 91
 relation with velocity of waves 87
 second-order 93
 temperature dependence of 89
 third-order 81, 93
 Elastic strain energy 82, 91, 93–94, 96, 466
 Elastic waves 86, 95, 97, 102, 349–350
 in piezoelectric media 349
 Elasticity
 dynamic 86
 linear 80, 82, 91, 93
 nonlinear 31, 91–93
 Elasto-optic coupling 88
 Elasto-optic domain pairs 515
 Elasto-optic effect 26–27, **155**, 175, 177–178, *see also* photoelastic effect
 Elasto-optic material 155
 Elasto-optic tensor 177, 344–345
 linear 177–178
 Elbow twins 419, 432
 Electric dipole operator 170
 Electric displacement 3
 Electric effect 153
 linear 154
 quadratic 154
 Electric field 3–4, 10, **11–12**, 14, 24, 31–32, 38, 54, 139–144, 153–155, 170–171, 181, 184, 186–190, 196–197, 199, 226–227, 274–275, 390, 393, 397–398, 440
 crystalline 108
 in Raman scattering 341–343, 345
 symmetry of 11
 Electric field gradient (EFG) 269, 271, 314, 322, 325, **327**, 328–330, 342
 in quasiperiodic structures 256–257
 lattice 329
 Electric-field induced second harmonic generation 153–154
 Electrical conductivity 5, **223**, 225–227, 229, 387, 390, 447, 455
 intrinsic 223, 226
 Electrical constraints 455–456
 Electrical displacement 349
 Electrical resistivity 223–224
 intrinsic 223–224
 Electrocaloric effect 3–4, 31
 Electrogryration 372, 380, 514, 540
 Electron diffraction 452, 469
 Electronic structure 314–315, 318–323, 325–327, 329, 332
 Electro-optic contribution 341–343, 345–346
 Electro-optic domain pairs 515
 Electro-optic effect 3, 31, **153**, 175–176, 350
 linear 153–154, 175, 178, 184, 343, 350
 nonlinear 155
 quadratic 153–155, 343
 Electro-optic materials 175
 Electro-optic tensor 175, 277, 514
 linear 174–176
 quadratic 346
 rank 3 350
 Electrostriction 3, 24, 26–27, 31, 380, 510, 514, 540
 Electrostrictive domain pairs 515
 Ellipticity 173, 175, 192

SUBJECT INDEX

- Elongations 24, 73, 75, 83, 86
 principal 74
 quadric of 73, 75–76, 83
 simple 75–76
- Enantiomorphic groups 31, 446, 471, 505
- Enantiomorphic twin states 471
- Enantiomorphism 372, 380, 407, 419, 427, 514
- Enantiomorphous crystals 274, 405, 415, 424, 484
- Energy bands 314, 318–319, 325, 328
- Energy density 79, 94, 120
- Energy gap 226, 230, 321
- Entropy 3–4, 31, 93, 362, 364, 392
- Epikernel 370–371, 376, 379, 381, 393
- Equitranslational phase transitions 370–372, 375–376, 378, 380, 381, 489, 494, 496
- Equitranslational subgroups 370, 378, 380–381, 392, 394, 438, 503–505
- Equivalence class 39, 44, 53–54, 399–401, 407, 492, 505, 512, 530
- Equivalence relation 401–403, 407
- Esterel twin 444–445
- Euclidean group 46, 51, 53
- Euclidean space 5, 46, 51
- Euclidean tensors 9
- Euclidean transformation 50–51, 53–54, 252, 402
- Eulerian description 92
- Even parity 339–340, 343, 345–346
- Exchange–correlation energy 320–321
- Exchange–correlation potential 320
- Exchange–correlation treatment 319, 323
- Exchange energy 108, 117, 120, 126–127, 145
- Exchange interaction 108–109, 120, 123–124, 131, 139, 141, 145
- Exchange interaction energy 110
- Exchange symmetry 117, 123
- Excitations 227–229, 278, 286, 290, 292, 314, 332, 334–336, 340–343, 346–348
 symmetry aspects 286
 vibrational 334
- Extended zone scheme 308
- Extensive quantity (parameter) 3–5, 31
- External forces 88, 133, 342, 347, 359
- Extinction
 straight 168
 symmetrical 168
- Extinction position 159–160, 162, 164, 168–169, 424, 433
- Extinction rules 269–270, 278, 471
- Extinctions 269, 472–474, 476, *see also* systematic extinctions
- Eyepiece 157–158, 163–164
- Fabry–Perot interferometer 208, 349, 352
 planar 351
 spherical 352
- Faraday rotation 153, 155, 269
- Fast ray 158–159, 162–163, 169
- Fault vector 414, 418, 425, 438, 456, 458, 459–461, 469
 determination 458
- Fe₄Al₁₃ 431, 457
- Feldspars 419, 433, 457, 467
 (K-) 466
 monoclinic 433, 436
 (Na-) 465
 triclinic 453, 470
- Fermi–Dirac statistics 108, 229
- Fermi energy 325, 327–329
- Fermi exclusion principle 321
- Fermi golden rule 223, 228, 332
- Fermi hole 321
- Fermi surface 223, 225, 227, 229
- Fermi velocity 224
- Ferrimagnetism 111, 143
- Ferrimagnets 106, 108, 113, 123, 126, 141–142, 326
- Ferrobielastic switching 438
- Ferrobielastic twinning 440
- Ferrobielastic twins 427, 464
- Ferrobielasticity 440, 515
- Ferroelastic domain pairs 486, 497, 505–507, 510, 512, 515, 517–518, 521, 526–528, 535
- Ferroelastic domain states 371, 376, 484, 486, 487, 488, 490–492, 497, 504, 506, 516–517, 519–521, 527–528
- Ferroelastic domain structure 440, 484, 486, 491, 520
- Ferroelastic domain twins 486, 497, 506, 518, 520–521, 527, 535–536, 539
- Ferroelastic domain walls 484, 486, 527–528, 535–536, 538–539
- Ferroelastic domains 128, 360, 398, 406, 435, 440, 450–451, 484, 518–519
- Ferroelastic–ferroelectric phases 440, 447, 518
- Ferroelastic–ferroelectric twins 520
- Ferroelastic materials 72, 359, 369, 398, 439–440, 451–454, 467–468, 510
 fully 128, 491, 510
 improper 491
 partial 491, 510
- Ferroelastic phase 177, 439, 451, 484, 497, 510, 528
 full 371, 378, 380–381, 497
 partial 375, 378, 380–381, 492, 497, 528
 potentially 439
- Ferroelastic single-domain pair 497
- Ferroelastic single-domain states 380, 406, 497–498, 507, 517–520, 535
- Ferroelastic transition 177, 359, 371, 382, 427, 447, 452, 467, 491, 503
 improper 371, 378
 proper 371
- Ferroelastic twins 438–440, 450, 452, 462, 464, 466–467, 469, 506, 517–521, *see also* mechanical twins
- Ferroelasticity 143, 439–440, 450
- Ferroelectric antiferromagnets 107, 131, 143, 144
- Ferroelectric domain pairs 510, 515, 527
- Ferroelectric domain states 371, 376, 380, 397, 486, 487, 492, 497, 527
- Ferroelectric domain structure 397–398, 425, 484, 486–487, 533
- Ferroelectric domains 128, 388, 398, 425, 435–436, 447, 484–485, 487
- Ferroelectric ferromagnets 107, 143, 145
- Ferroelectric materials 10, 12, 72, 131, 145, 154, 177, 382, 383, 387–388, 392, 397–398, 424, 455, 458–459, 510
 detwinning 440
 low-temperature 392
 potentially 425
- Ferroelectric phase 143, 371, 381, 388, 397, 435, 455, 459, 484, 492, 497, 510, 512
 full 371, 378, 380–381, 492, 497, 510, 527
- Ferroelectric transition 359, 382–383, 388, 420, 454–455, 459, 485, 536
 improper 371, 378
 low-temperature 392
 proper 371, 378, 380
- Ferroelectricity 143–145, 388, 392, 435, 440
- Ferrogyrotropic phase 515
- Ferroic classes 359–360, 369, 510
- Ferroic crystals 398
- Ferroic domain states 371, 375–376, 378, 487, 491, 493, 495, 505, 510
- Ferroic domain structure 485–486, 488
- Ferroic domains 128, 398, 406, 410, 488
- Ferroic materials 143, 398, 486, 516
- Ferroic phase 359, 370–371, 375, 379–380, 398, 484–485, 487–490, 492, 503, 506, 508, 510–511
 low-symmetry 379–380
- Ferroic single-domain states 371, 380, 488–489
- Ferroic species 128
- Ferroic symmetry 370, 372, 376, 487, 489
- Ferroic transition 358–360, 370–372, 392–393, 485–489, 491–496, 503
- Ferromagnetic domains 128, 397, 485
- Ferromagnetic ferroelectrics 107, 143, 145
- Ferromagnetic helical structure 110, 123
- Ferromagnetic materials 72, 106–107, 326, 345, 397–398, 467, 485
 fully 128
- Ferromagnetic phase 118–119, 130–132, 138, 143
- Ferromagnetic structures 119, 124, 128–129, 132
- Ferromagnetic vector 106, 119–120, 123, 131, 144
- Ferromagnetism 111, 113, 117, 123, 128, 143, 154, 397
 weak 110–111, 118, 120, 128–133, 136, 138–139, 141, 143–145
- Ferromagnetoelectrics 131, 143
- Ferromagnets 106, 108–109, 113–114, 116–117, 127–128, 132, 142, 145, 147–148, 382
 nuclear 110
 uniaxial 124–125
 weak 109, 120, 129, 131–133, 138, 141–143
- Fick's law 5
- Field tensors 4, 13, 181, 196–201, 217
- Figure of merit 200–201, 209
 for acousto-optic materials 179
- Fivefold rotation 418
- Fizeau interferometer 103
- Flash figure 159, 165, 168–169
 uniaxial 168
- Fluorite (CaF₂) 419, 429
- Focal plane (back) 164
- Forbidden reflections 269–274, 277–279
 glide plane 270
 screw axis 271
- Force constants 80, 286, 287, 292, 294–295, 306, 383
 matrix of 286–288, 290, 294–295
- Fourier module 246–250, 252, 254, 257
- Fourier's law 5
- Four-wave mixing 153–155, 181, 184, 191, 197
- Free-electron model 317, 319
- Free energy 31, 101–102, 105, 254–256, 360–369, 382, 388–389, 495, 510
- Fresnel equation 187
- Friedel's lattice theory 441, 449
- Fringe contrast 425, 458–459
- Fringe counting 161
- Full-potential methods 319, 322–324, *see also* linearized augmented plane wave (LAPW)
- Fullerene (C₆₀) 539
- Fully ferromagnetic materials 128
- Gadolinium molybdate (GMO) [Gd₂(MoO₄)₃] 367, 369–371, 504–505
- Galena (PbS) 429, 439, 443, 446, 455
- Gallium arsenide (GaAs) 83, 94, 178–179, 196, 226, 228, 291–292, 429, 446, 456
- Gallium phosphate (GaPO₄) 424, 428, 446
- Garnet twin 443
- Garnets 142, 414
- Gaussian beams 200, 204, 205, 208
- Gaussian system of units 107, 127, 140, 148
- Generalized gradient approximation 321
- Germanium 82, 226, 228, 443, 463
- Gibbs function 31–32, 361
- Gibbsite [Al(OH)₃] 417, 422, 433, 450
- Glide twin 462
- Grain boundaries 101, 223, 398–399, 413, 424, 441, 450, 464, 467–468, 532
- Gram–Charlier series 232, 235, 245
- Graphite 104, 247, 358
- Greek cross 434, 449, *see also* 90° cross
- Ground state 278, 314, 320–321, 328, 332
- Group calculator 393
- Group–subgroup relations 453
- Group-theoretical method 14
- Growth defects 425
- Growth face 413–414, 435, 437–438
- Growth morphology 415, 438
- Growth-sector boundary 414, 425, 456
- Growth-sector twins 424, 431–432, 436, 456, 475
- Growth sectors 414, 435
- Growth striations 414
- Growth twinning 424, 426
- Growth twins 398, 417, 419–420, 422–440, 447–452, 454–457, 460–462, 464, 468–469, 476–477, 507
 pseudo-hexagonal 431, 448
 pseudo-merohedral 436
- Grüneisen model 90
- Grüneisen parameter 102, 292
 averaged-mode 293
 generalized-mode 293
 mean 293–294
- Grüneisen relation 101–102, 104
- Gypsum (CaSO₄·2H₂O) 9, 417, 419–421, 426–427, 437–438, 445–446, 450–451, 453, 457, 464, 470

SUBJECT INDEX

- Gyration 153–154, 169, 171, *see also* optical activity tensor 172
 Gyration susceptibility 277
 Gyration tensor 14, 30, **171**, 173, 175
 Gyration vector 171, 173
 Gyrotropic domain pair 515
 Gyrotropic materials 14, 30–31, **169**, 171, 335
 Gyrotropic tensor 14
 Gyrotropic transition 515
- Habit modification 438
 Haematite (Fe_2O_3) 118, 129, 132, 137–138
 Hall constant 14, **227**
 Hall effect 14, 223, **226–227**
 Hamiltonian 141, 143, 274, 286–287, 290, 315, 320, 322, 337
 Harmonic approximation 101, 231, 242, 278, 286, 292
 Harmonic generation 181, 184
 ultrasonic 95, 97
 Harmonic oscillators 90, 101, 290, 293
 Harmotome twin 419, 464
 Hartree–Fock (HF) methods 319, 321, 325–326
 Head-to-head boundaries 425, 454–455, 469, 477
 Heat capacity 31, 102, 227, 291–294
 Heat current 223
 Heat flow 3, 5, 223, 227
 Helical structure **110**, 123, 132
 antiferromagnetic **110**, 123
 ferromagnetic 110, 123
 Helmholtz free energy 93, 293
 Hermann–Mauguin symbols 113, 134, 378–379, 393–394
 Hexagonal crystals 11, 87, 100–101, 110, 121, 132, 146, 442, 455, 474
 $\text{Hg}_{3-x}\text{AsF}_6$ 247
 High-order twins 443
 High-resolution transmission electron microscopy (HRTEM) 418, 437, 443, 451, 458–459, **461**, 462–463, 484, 534
 High-symmetry phase **360**, 363, 370, 380–381, 386, 487–488, 493, 516, 532
 High-temperature superconductors, *see* superconductors
 Higher-order susceptibilities 153, 155, 185
 Holmium 247
 Holohedral groups 49, 62, 427, 436, 447
 Homogeneous deformation 72–73
 Homogeneous shear 439, 451
 Hooke's law 3, **80**, 92, 146, 290
 generalized 81
 Huang conditions 287
 Hydargillite, *see* gibbsite [$\text{Al}(\text{OH})_3$]
 Hyperfine interactions 327
 Hypersthenite $[(\text{Mg}, \text{Fe})_2\text{Si}_2\text{O}_6]$ 169
 Hysteresis 72, 101, 144, 360, 364, 439, 484–485, 510
- Icosahedral groups 41, 56, 250
 Icosahedral quasicrystals 249, **256**, 259
 Icosahedral tensors 256
 Incoherence of twin boundaries 468–469
 Incoherent interfaces 468
 Incommensurate composite structures 247
 Incommensurate crystal (IC) 246–250, 252, 255, 257
 Incommensurate magnetic system 247
 Incommensurate structure 110, 117, 122–123, 132, **246**, 532–534
 Index of a group–subgroup relation 419, 425, 438
 Index of refraction 9, 11, 183, *see also* refractive index
 Index surface 153, **186**, 188–190, 192, 197, 200, 214
 Indicatrix 9, 11, 17, 156–158, 163–165, 168–169, 175–177, 179, 519
 biaxial 157, 176, 179
 uniaxial 156–157, 176–177, *see also* uniaxial ellipsoid
 Indium phosphide (InP) 438
 Induced polarization 144, 154–155, 182–183, 185
 Inelastic scattering 225, **334**, 338, 346–347
 Infrared absorption 310, 381
 Infrared activity 310–311, 338, 340–341, 344, 346
 Infrared spectroscopy 310, 384, 390, 466
 Inhomogeneous deformation 72
 Inner symmetry 235
- Integrity bases 378, 393
 extended 392–393
 Intensive quantity (parameter) **3–5**, 24, 31
 Interface energy 450, 455, 462
 Interference figures **163–164**, 166, 168–169
 Interferometers
 Fabry–Perot, *see* Fabry–Perot interferometer
 Fizeau 103
 Michelson 103
 Interferometry 89, 103–104, 351–352, 355
 Intergrowths 413, 415, 418, 423–424, 429, 431, 433, 436, 441, 443, 446, 461–462, 469–470, 507
 arbitrary 413
 oriented 413, 418
 parallel 413–414, 438
 Intermediate group 371, 378, 381, 402–403, 407–410, 490, 492, 494, 503, 509–510
 Internal energy 31, 93, 95, 291
 Intersection group 421–422, 430, 447
 Intersection symmetry 414, 421–422, 426–428, 430, 432–434, 439, 452–453, 455
 Intrinsic electrical conductivity 223, 226
 Intrinsic electrical resistivity 223–224
 Intrinsic mobility **225–226**, 227
 Intrinsic property 80, 225
 Intrinsic symmetry **13**, 26
 Invariance
 rotational 287
 time-reversal 306, 308
 translational 287, 289
 Invariant tensors 34, 52, 67–68, 258
 Invariants 14, 16, 52, 54, 69, 94, 96, 121, 124, 130, 142–143, 232, 242, 256
 Inversion 35, 54, 118, 275, 297, 301
 Inversion boundaries 458
 Inversion centre 82, 118, 142, 276, 417, 436, 459
 Inversion operator 317
 Inversion twins **416**, 423, 425–426, 428, 435–436, 442, 447, 454–459, 469, 471
 Ionization potential 321
 Irreps, *see* irreducible representations
 Iron 81, 145, 147
 Iron borate (FeBO_3) 129, 429, 436, 442, 446, 448
 Iron-cross twin 419, 447, 457
 Irrational boundary 434
 Irreducible multiplier representation 302–303, 308–309, 311, 341
 Irreducible projective representations, tables of 63
 Irreducible representations **36–42**, 44–45, 47–52, 66–68, 144–145, 296, 302–311, 316–318, 325–326, 337–339, 341, 366–368, 370
 in domain structures 493–494, 496, 513–515
 in phase transitions 375–376, 379–382, 392–394
 in quasiperiodic structures 250–251, 253, 255–256, 262, 268
 of lattice translation groups 47
 of space groups 47–49, 62, 106, 121–124, 252, 309–310, 347, 381
 of tensors 51, 182, 255
 physically 41–42, 57, 370, 376, 378, 381, 493, 496
 tables 34, 49, 56–64, 123, 262, 268, 309–310, 368, 372, 378
 Irreducible tensors 51, 279
 Irreducible vector space 304, 363
 Irreducible wedge 318
 Isogynes **164**, 165–169
 Isostructural crystals 446, 450
 Isothermal elastic constants 88, 90, 94
 Itinerant electrons 326
- Jahn–Teller phase transition 91
 Japanese twins 427–429, 445, 469, *see also* La Gardette twins
 Jones matrix 172
- Kantennormalengesetz 397, 416, 441, 470
 Kernel 37, 370–371, 379, 393
 Kerr effect 153–154, 184, *see also* electro-optic effect (quadratic)
 Klassengleiche subgroup 438
 Klockmannite (CuSe) 443
 Knee twin 432
 Kohn–Sham equations 320, 322–323
 Kohn–Sham orbitals 320–321
- Koopman's theorem 321
 Korringa–Kohn–Rostocker (KKR) method 322, 325, 327
 Kronecker matrix 92
 Kronecker products 337, 393
 Kronecker symbol 5, 72
 Kund tube 88
- La Gardette twins **428**, 444, *see also* Japanese twins
 Laevorotation 169, 171
 Lagrangian description 92
 Lagrangian strain 92–95, 516
 Lamé constants
 second-order 85, 94
 third-order 93
 Lamellar twinning 419
 Landau condition 378–379
 Landau–Devonshire theory 381–382
 Landau free energy 360, 378, 533, 535, 537–538
 Landau polynomial expansion 364–365
 Landau problem
 direct 378
 inverse 376, 378, 381, 494
 Landau theory 106, 119, 121, 123, 125, **360**, 361–362, 367, 370, 381–382, 397, 485, 494, 535
 Landé g-factor 108, 139
 Langbeinite $[\text{K}_2\text{Mg}_2(\text{SO}_4)_3]$ 423, 452, 528
 Lanthanum aluminate (LaAlO_3) 385, 466
 Lanthanum pentaphosphate ($\text{LaP}_5\text{O}_{14}$) 359, 385
 Latent heat 362, 364
 Lattice coincidence 399, 415, **441**, 444, 446, 448, 450, 455
 one-dimensional 444
 three-dimensional 442
 two-dimensional 444
 Lattice concept of twinning 397, 440
 Lattice dynamics 90, 101, 231, 286, 288, 294
 Lattice index 441–442, 444, 447
 Lattice pseudosymmetry 444–445, 450
 Lattice translation subgroup **35**, 46–48, 315–316, 318
 irreducible representations 47
 Lattice vibrations 304, *see also* phonons
 optical 334–335
 Lattices of subgroups 371, 376, 378, 380–381, 392–394, 490, 495
 Laue class 15–16, 82, 93, 349, 351–355, 471, 514
 Layer groups 486, 497, 521, 527–539
 dichromatic 399, 506
 sectional 529–532, 537–539
 Lead 224
 Lead barium phosphate $[(\text{PbBa})_3(\text{PO}_4)_2]$ 466
 Lead germanate ($\text{Pb}_5\text{Ge}_3\text{O}_{11}$) 515
 Lead magnesium niobate 358
 Lead phosphate $[\text{Pb}_3(\text{PO}_4)_2]$ 484
 Lead strontium phosphate $[(\text{PbSr})_3(\text{PO}_4)_2]$ 466
 Leucite (KAlSi_2O_6) 465, 491, 516
 Leybold twins 424, 427, 429, 436, 446–447, *see also* Dauphiné–Brazil twins
 Liebisch twins 427, *see also* Dauphiné–Brazil twins
 Lifshitz condition 132, 378–379
 Ligand-field theory 325
 Linear acousto-optic effect 153, 155
 Linear birefringence 139, 153, **156–157**, 163, 170, 173, 175, 177
 Linear combination of atomic orbitals (LCAO) 319, **321**, 325, 330, 332
 Linear combination of muffin-tin orbitals (LMTO) 319, **322**, 325, 327
 Linear compressibility 83
 Linear elasticity 80, 82, 91, 93
 Linear electro-optic effect 153–154, 175, 178, 184, 343, 350
 Linear forms 7–8
 Linear magnetic birefringence 138–139
 Linear magnetoelectric effect 106, 128, 140–144
 Linear magnetoelectric tensor 148
 Linear magnetostriction 128, 134, 137–139, 144
 Linear optics 153, 155–156
 Linear polarization response function 182
 Linearized augmented plane wave (LAPW) 322–328, 330, 332
 Lineshape function 336
 Lithium formate monohydrate $[\text{Li}(\text{CHO}_2)\cdot\text{H}_2\text{O}]$ 424–425, 454–455

SUBJECT INDEX

- Lithium niobate (LiNbO_3) 175, 196, 214, 217, 424, 455
 Local coordinate system 323–327, 330–331
 Local density approximation 320
 Local orbitals 323, 330
 Local susceptibilities 269–270, 274
 Local tensorial susceptibility 271
 Localized electrons 326
 Longitudinal optic mode (LO) **336**, 341, 346, 383, 392–393
 Low-energy boundaries **415**, 446, 451
 Low-symmetry phase 358, 360, **363**, 370, 381, 383, 406–407, 409, 484, 487–489, 493, 503, 516
- Macles* 414, 507, *see also* twins
dipériodiques 441, *see also* diperiodic twins
monopériodiques 441, *see also* monoperiodic twins
par mériédrie 397, 442, 446, *see also* twinning by merohedry
par mériédrie réticulaire 397, 442, 448, *see also* twinning by reticular merohedry
par pseudo-mériédrie 397, 446, *see also* twinning by pseudo-merohedry
par pseudo-mériédrie réticulaire 397, 447, *see also* twinning by reticular pseudo-merohedry
tripériodiques 441, *see also* triperiodic twins
- Magnetic anisotropy 108, 120–121, 125–126, 129–133, 139–141, 145, 147, 148
 Magnetic anisotropy energy 120
 Magnetic anisotropy energy density 120
 Magnetic birefringence 138–139, *see also* Cotton–Mouton effect
 Magnetic Bravais lattices 106, 114–117, 122, 131, 142
 Magnetic cell 109, 115–118
 Magnetic field 3–4, 12, 54, **106–108**, 124–125, 127–133, 137–140, 142–145, 147–148, 153, 155, 226–227, 275, 484
 Magnetic groups 404
 Magnetic induction 3–4, 11, 14, **107**, 148, 155
 symmetry of 12
 Magnetic lattice 114–117, 122–123
 Magnetic linear dichroism 270, 278
 Magnetic materials 106, 338
 Magnetic moment density 106, 110, 117
 Magnetic permeability 107
 Magnetic point groups 53, 55, 62, 66, 106, 110, 112–113, 117, 119–121, 123, 129–134, 137, 139–142, 144
 grey 111
 white 111
 Magnetic polarization 143
 Magnetic resonant X-ray diffraction 280
 Magnetic scattering 269, 279–280
 non-resonant 274–275
 Magnetic space groups 53–54, 106, 110–111, 117, 121, 128–129, 133, 140, 144
 Magnetic spin–spin interaction 120
 Magnetic sublattice 106, 108–109, 123
 Magnetic superspace groups 250–251
 Magnetic susceptibility 4, 13, 54, **107–108**, 124–125, 131–132, 141–143, 148, 269
 Magnetic symmetry 53, 55, 106–107, **110**, 113–114, 117–118, 125, 131–134, 144
 Magnetic transitions 106, 122
 Magnetite (Fe_3O_4) 108, 274, 443
 Magnetization 3, 106–110, 113, 120, 124–129, 131–133, 136, 138–140, 142–143, 145–148, 467
 Magnetocaloric effect 4
 Magnetochiral dichroism 270, 276
 Magnetoelastic energy 121, 133–134, 137, 145–148
 Magnetoelectric effect 4, 118, 139–142, 144
 linear 106, 128, 140–144
 nonlinear 142
 Magnetoelectric multiferroics 143
 Magnetoelectric susceptibility 54, 142
 Magnetoelectric tensor 140–141, 252
 Magneto-optic effect 3, **153**
 linear 153
 nonlinear 153
 quadratic 153, 155
 Magneto-optic tensor 344–345
 Magnetostatic energy 126
- Magnetostriction 3, 137, 139, **145**, 147–148
 linear 128, 134, 137–139, 144
 spontaneous 121, 128, **145–146**, 147–148
 Magnons 334, 338
 Maker fringes **215**, 217
 Mallard pseudo-cube 435
 Manley–Rowe relations 185, 191, 207
 Many-body problem 320
 Mappings **400–401**, 402, 405–406
 Martensitic transformation 358
 Material tensors **4**, 371, 398, 488, 509, *see also* physical property tensors (or property tensors)
 Matrix method 14–16, 18
 Matrix of physical properties **3–4**, 13, 31
 symmetry of 4
 Matter tensors, *see* material tensors
 Matthiessen's rule **223**, 227
 Maxwell's equations 12, 155, 181, 186
 Mean-square displacements 231, 242
 Mechanical twinning 439–440, 451, 453
 Mechanical twins 397–398, 436, **439–440**, 452–453, 464, *see also* deformation twins
 Median law 417, 433
Mediangesetz 417, *see also* median law
 Mercury 224
Mériédrie réticulaire 447, *see also* reticular merohedry
 Merohedral twins 416–417, 422–425, 427–429, 436–437, 439–440, 442, 444, **446–447**, 454–455, 458–460, 464, 467–472, 477
 of lattice index $[j] = 1$ 447, 454
 of lattice index $[j] > 1$ 455
 Merohedry **422**, **447–448**
 of translation groups (lattices) 447
 Metric tensor **5**, 6, 9, 13, 35, 67, 253–254
 for a quasicrystal 257
 tensor nature of 9
 Mica 104, 162, 450
 Michelson interferometer 103
 Microcline (KAlSi_3O_8) 433, 453
 Microtwins 434
 Mimetic twins 419
 Mobility **225**, 226–227
 intrinsic **225–226**, 227
 Modulated structures 246, 253
 Modulation
 composition 247
 displacive, *see* displacive modulation
 Modulation wavevector **246**, 247–249, 253
 Moiré pattern 444
 Moments 231–232
 Momentum of the electron 229, 274, 317
 Monoperiodic twins **441**, 446, 450
 Montmartre twin 426–427, 445–446, 451, 453, 457
 Morphic effects 146, **342**, 343, 345, 347, 371, 379–380
 Morphic properties 490, 494–495
 Morphic tensor components 487, 489–490, 493–494, 511, 515
 Morphological classification of twins 417–419, 440
 Mosaic crystal 413
 Mössbauer radiation 269
 Mössbauer spectroscopy 327–328
 Muffin-tin approximation (MTA) **319**, 322–324
 Muffin-tin orbitals 319, *see also* linear combination of muffin-tin orbitals (LMTO)
 Multiferroics 143–144
 magnetoelectric 143
 Multilinear forms 7
 Multiple twins 417, **418–419**, 421, 423, 432, 437, 444, 446, 449, 453, 469
 fivefold 464
 Multipliicator group 43–44
 Multiplicity 36, 39, 42, 52–54, 62, 67–68, 255, 302, 309
 Multiplier corepresentation 297
 Multiplier representation 43, 296
 Murnaghan constants 93–94
 Mutual exclusion rule 340
 Nanocrystalline materials 437, 443, 463
 Needle domains **465**, 468
 Néel temperature 125, 128, 131, 141, 143
 Negative thermal expansion 100, 104
 Neumann's principle **11**, 13, 15, 84, 146, 414
 Neutron diffraction 144, 269, 469
- Neutron inelastic scattering 288–289, 291, 310, 387
 Neutron magnetic scattering 275
 Neutron scattering 123, 128, 144, 306, 381, 387, 391
 Nickel 121, 147
 Niobium dioxide (NbO_2) 359
 Nonbonding states 326, 330
 Non-collinear antiferromagnets 106, 123
 Non-crossing rule 330
 Noncrystallographic symmetry 247, 254, 437
 Non-equitranslational phase transitions 371, 378, 381–382, 504, 528
 Non-ferroelastic domain pairs 486, 497, **505**, 507, 509, 511–515, 527–528, 533
 Non-ferroelastic domain states 486, **491–492**, 505
 Non-ferroelastic domain structure 398, 440, **484**, 488, 491
 Non-ferroelastic domain twins 486, **497**, 506, 512, 533
 Non-ferroelastic domain walls 484, 486, **533**, 536
 Non-ferroelastic materials 360, 440, 491
 Non-ferroelastic phase 375, 380, **484**, 497
 Non-ferroelastic transition 447, 467, 491–492
 Non-ferroelastic twins 439–440, **464**, 468, 506, 514, 521
 Non-ferroelectric domain states 492
 Non-ferroelectric phase 338, 375, 380, 384, **492**, 497
 Non-ferroic transition 358–359, 382
 Nonlinear crystals 181, 190–191, 201–203, 205, 207, 209, 211–215, **216–219**
 Nonlinear elasticity 31, 91–93
 Nonlinear magnetoelectric effect 142
 Nonlinear optics 10, 15, 31, 153, 155, **181**, 182, 184, 187, 334
 Nonlinear polarization 181, 184, 190–191, 196, 215
 Nonlinear susceptibility 195, 215
 Non-magnetic materials 337–338
 Non-magnetic resonant scattering 279
 Non-magnetic resonant X-ray diffraction 280
 Non-merohedral twins 423, 425, 427, **438**, 452, 454, 456, 464, 467–470
 Non-pyroelectric acentric crystals 456
 Non-pyroelectric noncentrosymmetric crystals 456
 Non-symmorphic space group 48, 50, 297, 308, 315, 331
 Normal coordinates 252, 290, 303, 334–338, 341, 344–347, 386
 Normalizer 393–394, 399, **403**, 404, 407–408, 410, 492–493, 496, 498
 Nuclear antiferromagnets 110
 Nuclear charge density 328
 Nuclear quadrupole moment **327**, 328
 Nuclear spin quantum number 327
 Numerical aperture 157–158, 163
- Objective lens 157
 Obtuse bisectrix figure 168
 Octagonal quasicrystals 257–258
 Octagonal tiling 247, 249, 257
 Odd parity 339–340, 343
 Off-site contribution 330, 332
 Ohm's law 5
 Olivine 159, 161
 Onsager relations **5**, 223, 344
 Optic axes 11, 138, **157**, 159–160, 163–165, 167–169, 171–173, 175, 188–191, 199, 215, 424
 Optic axial plane, *see* axial plane
 Optic axis figure 164, 167, 169
 uniaxial 164–165, 168
 Optic branches 289, 335
 Optic modes 292, 302, 343
 longitudinal, LO **336**, 341, 346, 383, 392–393
 polar 336
 Raman-active 346
 transverse, TO **336**, 341, 346, 383
 Optical activity 11, 14, 154, **169–170**, 277, 372, 380, 424, 427–428, 447, 489, 514–515, 540, *see also* gyration
 Optical anisotropy 156
 Optical anomaly 414, 435
 Optical indicatrix, *see* indicatrix
 Optical microscope, *see* polarizing microscope
 Optical parametric amplification 218
 Optical parametric oscillation 181, 200, **211**, 213
 Optical path difference 160

SUBJECT INDEX

- Optical phonons 226, 228, 292, 334, 338, 341–344, 347, 383–387
 Optical rectification 153–154, 184
 Optical rotation 14, 153–155, 164, 169–171, 173, 175, *see also* gyration
 Optical rotatory power 14, 30, 171–172
 Optical spectroscopy 289, 310, 384
 Optics
 linear 153, 155–156
 nonlinear, *see* nonlinear optics
 Orbit 399–401, 405–410, 489–490, 497, 503, 505–506, 508–512, 515, 518, 521, 528, 530, 532, 534–535
 Orbital magnetic moment 106
 Order parameter 91, 121–122, 141, 144, 360–363, 364–371, 379, 381–383, 386, 389, 393, 406, 408, 485–486, 494–495, 505, 510, 535–538
 fluctuations 125
 primary 370–371, 376, 378–380, 393, 407, 487, 489, 494–495, 515
 principal 408, 410, 490–491
 secondary 371, 378, 407, 409–410, 490–491
 Orientation relation 413, 415, 417–420, 423–424, 426, 428, 433, 450, 469, 477
 crystallographic 413–417, 441, 450, 470
 noncrystallographic 415
 Orientation state 128, 359, 398, 406, 415, 417–423, 425–429, 431–433, 435–436, 438–440, 451–452, 454, 464, 466, 469, 487–488
ORTEP 235, 242
 Orthochromites 130–131, 133, 138
 Orthoclase (KAISi_3O_8) 419, 423, 436, 453, 464, 466
 Orthoferrites 119, 130–133, 138, 142
 Orthogonality 273, 304, 321, 323, 330
 Orthogonality relations 34, 38, 39–41, 44, 52, 56, 197
 Orthoscopic configuration 157, 163, 164–165, 167–168
 Out-of-phase rotation 385
 Outer product 9, 41, 383
 Outer symmetry 235
 Overtones 347
 Paraelectric phase 382, 397
 Parallel-lattice twins 416, 427, 464, 470
 Paramagnetic prototype 128
 Paramagnetic susceptibility 107–108
 Paramagnetoelectric effect 143
 Paramagnets 106–108, 111, 114, 117, 124–125, 134, 140, 142–143
 Parametric amplification 153–154, 181, 200, 211
 Parent clamping approximation 488, 503, 504–505, 528, 535, 539
 Parent phase 359, 370–371, 378, 380–382, 398, 399, 406, 438–439, 451–452, 477, 484, 487–490, 492–493, 496–498, 504, 507, 517–518, *see also* prototype (or high-symmetry) phase
 Parent symmetry 372, 378, 464–465, 487, 489
 Partial charges 326, 327, 329–330
 Partition (of a set) 400–401, 403–404, 407–408, 410, 490, 503
 Partition function 293
 Passive representation 379
 Penetration trillings 435
 Penetration twins 397, 417–418, 419, 423, 429, 434, 436, 438, 442, 446–447, 453, 455
 Penrose tiling 247
 icosahedral 250
 Pentagonal-decagonal twins 431
 Pericline 434, 437, 466
 twin law 433–434, 453, 470
 Periodic boundary conditions 47, 287, 316, 318–319
 Permissible boundaries 451–456
 Permissible composition planes 452
 Permissible domain boundaries 452
 Permissible domain walls 453, 486
 Permissible planes 451
 Permissible twin boundaries 420, 452–453, 455
 Permittivity of vacuum 3, 155, 186, 334
 Permutation tensor 10, 14, 70, 77, 171
 Perovskites 91, 143, 177, 358, 383, 385, 419, 435, 438–439, 462, 466–467, 492, 497, 512, 527
 Phase conjugation 155
 Phase jump 425, 458
 Phase matching 88, 181, 187, 191–195, 196–197, 199–218
 Phase mismatch 190, 191, 200–202, 205–207, 209–210, 212, 217
 Phase transformation (polymorphic) 438
 Phase transitions 360, 366, 491
 antiferromagnetic 90
 continuous 121, 360, 363, 366–367, 370–371, 381–382, 384, 389, 397
 diffusion-assisted 358
 diffusionless 358
 discontinuous 360, 364, 367, 370, 376, 382
 displacive 293, 358, 381, 383, 385–386, 388–389, 438–439
 equitranslational 370–372, 375–376, 378, 380, 381, 489, 494, 496
 ferroelectric 397
 first-order 364, 370, 382, 503
 first-order magnetic 132, 138
 magnetic 117, 125
 non-equitranslational 371, 378, 381–382, 504, 528
 non-reconstructive 358
 order-disorder 358, 388–389, 438, 453
 reconstructive 358
 second-order 360, 370, 381–382
 second-order magnetic 117, 125–126, 129, 132–133
 structural 90, 358–360, 381, 385–387, 390, 392, 397–398, 484–485, 494
 Phason 251, 254–255, 258
 degrees of freedom 254, 256
 elasticity tensor 256, 258–259
 strain tensor 258–259
 Phillipsite twin 419, 464
 Phonon degrees of freedom 254, 256
 Phonon bands (or branches) 224, 288–289, 294, 302, 306, 308–309, 341, 385, 388
 degenerate 288
 LA 225, 349, 351
 LO 225, 336, 341–342, 346, 383, 392
 TA 225, 349, 351
 TO 225, 336, 342, 346
 Phonon contribution to elastic constants 254, 258
 Phonon density of states 291
 Phonon dispersion 288–291, 301, 310–311
 Phonon dispersion curves 311
 Phonon drag 225, 227
 Phonon frequencies 289
 Phonon scattering 226–227
 Phonons 224–228, 286, 287, 289–292, 298, 302–303, 305–306, 308–311, 334–336, 338, 341, 346–347, 386
 acoustic 91, 226–228, 290, 302, 334, 346, 349
 E 342
 electron scattering by 224, 226
 optical 226, 228, 292, 334, 338, 341–344, 347, 383–387
 Raman-active 340, 385
 strain tensor 258
 Photoelastic effect 3, 8, 26, 153, *see also* piezo-optic effect
 linear 155, 176
 Photoelasticity 78
 Physical irreducibility 370
 Physical property tensors (or property tensors) 4, 13–14, 31, 370–372, 378–380, 405–406, 485–487, 493–496, 505, 509, 513–515, *see also* material tensors
 Piezocalorific effect 3–4, 31
 Piezoelectric constants 24, 32, 485
 Piezoelectric crystals 86, 143, 226, 341, 344, 346, 349–351
 Piezoelectric domain pairs 515
 Piezoelectric effect 4–5, 8, 24, 31–32, 175, 258, 343
 Piezoelectric resonators 32, 440
 Piezoelectric stress coefficients 32
 Piezoelectric tensor 24, 25–26, 142, 154, 175, 341, 343, 349, 359, 372, 510, 515
 in octagonal quasicrystals 258
 in quasiperiodic structures 255–256, 258
 Piezoelectric transducer 86, 88–89
 Piezoelectricity 3–4, 11–13, 15, 78, 143, 175, 226, 380, 427, 435, 514, 540
 Piezomagnetic effect 4, 29, 128, 133–137, 138–141
 Piezomagnetic tensor 134–135, 137, 142, 148
 Piezomagnetism 3, 15, 106, 134, 136–137, 141, 143
 Piezomagnetoelectric effect 143
 Piezo-optic effect 8, 31, 155, 176, 350, *see also* photoelastic effect
 Piezo-optic tensor 26–27, 177, 345, 350, 372, 515
 Plagioclase 159, 169
 Plagioclase twins 433–434, 453, 470
 Planes of strain compatibility 451
 Plasmons 334, 337, 346
 Pleochroism 158–159, 169
 Plesiotwins 418
 PMN-PT 527
 Pockels effect 153–154, 351, *see also* electro-optic effect (linear)
 Pockels tensor 350–351, *see also* piezo-optic tensor
 Point-charge model 327, 329
 Point groups for quasicrystals 255
 Poisson's ratio 3, 82–83
 Polar force 342
 Polar tensors 24, 25–26, 100, 107, 236–238, 241, 337–339, 341–343, 346, 380, 511, 514–515
 Polar vector representation 337
 Polar vectors 10, 12, 140, 337–339, 341, 344, 346
 Polaritons 334, 341
 Polarizability 310
 Polarizability operator 170
 Polarizability tensor 311
 Polarization 178, 182, 195–200, 203–204, 209–210, 214, 252, 269, 272–275, 278, 322, 334–336, 341, 350, 380, 435, 514, 527, 534
 acoustic 14
 circular 172–173, 273
 dielectric, *see* dielectric (or electric) polarization
 elliptical 163, 173
 induced 144, 154–155, 182–183, 185
 linear 170
 nth order 182
 nonlinear 181, 184, 190–191, 196, 215
 of elastic waves 87
 rotatory 3
 second order 181
 spin 326
 spontaneous, *see* spontaneous polarization
 Polarization colours 159–164, 169
 Polarization modes 184
 Polarization selection rules 337, 340, 342, 346
 Polarization states 154–155, 184, 192
 Polarization vector 87, 169, 186, 190, 246, 269, 273–275, 279, 287–290, 301–302, 334–335, 337, 340–341, 350–351
 Polarized X-rays 270, 273, 280
 Polarizer 157, 158–159, 162–164, 273, 424, 431, 519
 Polarizing microscope 157–158, 163, 169, 397, 424
 Polycrystalline aggregates 463, 467
 Polycrystalline materials 100–101, 413, 438, 464, 467
 Polymorphs 418, 457, 459, 461, 463, 466
 Polysynthetic twins 418, 419, 423, 432, 435, 437, 453, 459–460, 464–465, 469
 Potassium dihydrogen phosphate (KDP) (KH_2PO_4) 192, 205, 217, 388, 397, 485
 Potassium lithium sulfate (KLiSO_4) 308, 417, 424–425, 436–437, 447, 454–455, 460–461, 466
 Potassium nickel fluoride (KNiF_3) 90
 Potassium niobate (KNbO_3) 212
 Potassium nitrate (KNO_3) 385
 Potassium selenate (K_2SeO_4) 246
 Potassium sulfate (K_2SO_4) 419, 431, 438–440, 448, 464, 466
 Potassium thiocyanate (KSCN) 539
 Potassium titanyl phosphate (KTP) (KTiOPO_4) 203–204, 208–209, 213–214, 217, 425, 447, 455
 Potassium trihydrogen selenite $\text{KH}_3(\text{SeO}_3)_2$ 447
 Potassium zinc fluoride (KZnF_3) 89, 91
 Powder diffraction 466, 469
 Poynting vector 187, 203–204
 Praeseodymium sulfide (PrS_2) 448–450
 Principle of superposition 173
 Probability density function (p.d.f.) 232, 235, 242
 Projection operator 52, 54, 303–306, 325, 344
 Projective representations 43–46, 48–50, 61–62
 Propagation tensor 290
 Property tensor 139

SUBJECT INDEX

- Prototype (or high-symmetry) phase 128, 147–148, **359**, 360, 370, 385, 438, 440, 446, 453, *see also* parent phase
rational 452
- Prototype structure 359, 385
- Pseudo-coincidence 442, **444**, 446–448, 450
- Pseudo-fivefold axis 431
- Pseudo-méridrie réticulaire* 447
- Pseudo-merohedral twins 436, 444, **446–447**, 450, 468, 474–475, 477
of lattice index $[j] = 1$ 447
- Pseudo-merohedry 450
- Pseudomomentum 317, 319
- Pseudo-potential 319, **322**
- Pseudoscalar **14**, 30, 140, 277, 380
- Pseudosymmetry 415, 422, 433–434, 446–447, 450, 459, 465, 468, 518
composite 432
- Pseudotensor character 54
- Pseudotensors 51, 54, 64, **67**, 171, 251–252, *see also* axial tensors
- Pseudo-threefold twin axis 417
- Pseudovectors 3, **10**, 13–14, 51, 54, 122, 171, 251, 262, *see also* axial vectors
- Pulse-echo technique 88–89
- Pulse-superposition method **89**
- Pure deformation 73–74, 76
- Pure shear 76
- Pure shear stress 78
- Pushrod dilatometry 103, **104**
- Pyrite (FeS_2) 419, 447, 457
- Pyroelectric coefficients 32
- Pyroelectric domain structures 425
- Pyroelectric effect 4, **12**, 31–32
- Pyroelectric materials 387, 424–425
- Pyroelectricity 3–4, **12**, 380, 435, 447, 455–456, 514
- Pyromagnetic effect 4, 14
- PZN-PT 527
- q**-dependent terms 342, 346
- Quadratic electro-optic effect 153–155, 343
- Quadratic magneto-optic effect 153, 155
- Quadric of elongations 73, 75–76, 83
- Quadrilinear forms 8
- Quadrupole–quadrupole interaction 275, 279–280
- Quantum-mechanical treatment 314–315, **319**, 332
- Quartz 12, 104, 158, 163–164, 171, 173, 175, 181, 217, 289, 359, 413, 419, 423–425, **428**, 433, 436–440, 444–447, 454, 456, 459, 461, 469, 515, 533
alpha- (low-temperature) 274, 427–429, 457, 459, 534
beta- (high-temperature) 427–429, 438, 457, 534
 X -cut 89
 Y -cut 89
- Quartz wedge 157, 161–163
- Quasi phase matching **195–196**, 201, 213–214, 533
- Quasicrystals 247–250, 255–259
icosahedral 249, **256**, 259
- Quasi-harmonic approximation 90, 101, 293, 336
- Quasi-harmonic model 286, 292
- Quasimoments 232
- Quasiparticles 290–291
- Quasiperiodic structures 246, 256
- Quasi-static limit 337, 347
- R*-irreducible representations (*R*-ireps) 370–371, 378–379, 494, *see also* irreducible representations (physically)
- Raman-active modes 310
- Raman activity 310–311, 337–338, 340, **343**, 347, 378, 383
field-induced 343
force-induced 342–343
intrinsic 344
- Raman scattering 181, 184, **334**, 335, 340, 347
antisymmetric 338, 340–341
electric-field-induced 343
first-order 335, 342, 347
forbidden 346
force-induced 342–343
higher-order 346
in a magnetic field 344
- Raman scattering 334–335, 347
magnetic-field-induced 344
second-order 346–347
selection rules 339, 341–342, 347
strain-induced 345
stress-induced 345
symmetric 340, 343, 345
- Raman shift 334–335, 347
- Raman spectral line shape 336
- Raman spectroscopy **310**, 381, 383–385, 387, 390, 466
- Raman tensor 334, 336–338, **341–343**, 345–347
electric-field-induced 343–346
field-induced 344
first-order 336
first-order field-induced 345
force-induced 342–343
intrinsic 342, 344–346
magnetic-field-induced 344–345
q-induced 345
strain-induced 345
symmetry of 337–338
zero-field 345
- Rare-earth metal manganates 145
- Rare-earth metals 107, 110, 130, 145
- Ray representations 43
- Rayleigh length 203, 205
- Rayleigh scattering 227
- Reciprocal basis **6–7**, 38, 62, 246, 248–250, 253
- Reciprocal cell 7, 231, 235
- Reciprocal lattice 6, 10, 47, 49, 62, 122, 232, 246–250, 252–253, 314, 316–318, 323, 470–476
- Reciprocal-lattice vectors 47, 49, 248, 272, 294, 296–297, 302
- Reciprocal space **6–7**, **10**, 38, 102, 242, 248, 253, 294, 301, 309, 314, 318, 470–471, 475, 506
- Recrystallization twins, *see* annealing twins
- Reducible representations **36**, 39, 42, 44, 51, 119, 255, 302–303, 342–343, 347, 370, 376, 378, 494, 496
- Reduction of tensor components 15–16
rank 2 15–16
rank 2 axial tensors 29
rank 3 15, 17
rank 3 reduced polar tensors 24
rank 4 15, 20
rank 4 reduced polar tensors 26
- Reflection twinning 425
- Reflection twins **416–419**, 424, 428, 432–434, 436, 440, 442–446, 448, 450, 456–459, 461–462, 470, 477
- Refractive index 138, 154–155, 175, 334
calculation of 170
changes due to strain 177
extraordinary 156
measurement of 159–160
ordinary 156
real and imaginary components 170
variation with wavelength 169
- Relativistic effects **320**, 322
- Relativistic interactions 109, 120, 123–124
- Relief 159, 164
- Renniger diffraction 273
- Reorientation transition (magnetic) **132**, 138
- Reorientation transitions 106, 133
- Repetitive twins 418
- Representation quadric 100, 242
- Representation surface 8–9, 84, 100, 235, 242
- Representations **34**, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second kind 308
of the third kind 307–308
passive 379
projective 43–46, 48–50, 61–62
reducible, *see* reducible representations
regular 36, 39
- Representations 34, 36–37, 39, 317
active 379
atomic sphere 327
contragredient 38
gerade 41
irreducible, *see* irreducible representations
of double groups 45
of double point groups 61
of double space groups 50
of point groups 35, 40, 49, 61
of space groups 49
of the first kind 307–308
of the second

SUBJECT INDEX

- Shear
 homogeneous 439, 451
 pure 76
 simple 76
 spontaneous **439**, 451–452, 465, 485, 539
- Shear strain 102, 178, 369, 451
 spontaneous 439, 452, 454, 465
- Shear stress 78, 440
- Short-range force 383
- Short-range interactions 383
- Shubnikov group 53, 508
- Shubnikov symbols 113, 393
- SI units 3, 107, 127, 138, 140, 148
- Sigma notation 441–442
- $\Sigma 1$ twins 470, 423–424, 427, 442, 446, **470**, 471–472, 474–475, 477
- $\Sigma > 1$ twins 475
- $\Sigma 2$ twins 442
- $\Sigma 3$ bicrystal boundaries 463
- $\Sigma 3$ twin interface 443, 462
- $\Sigma 3$ twins 440, 442–443, 446, 454–455, 463, 471–472, 474–475, 477
- $\Sigma > 3$ twins 442
- $\Sigma 5$ twins 443, 448, 450, 455, 471–474, 477
- $\Sigma 7$ twins 448, 471, 473–474, 477
- $\Sigma 9$ twins 443
- $\Sigma 13$ twins 473–474
- $\Sigma 17$ twins 473
- $\Sigma 19$ twins 474
- $\Sigma 25$ twins 473
- $\Sigma 27$ twins 443
- $\Sigma 33$ twins 443, 455
- $\Sigma 81$ twins 443
- Silicon 82, 104, 225–226, 228
- Silicon tricrystal 443
- Silver 463
- Simple shear stress 78
- Simple twins **418**, 419, 421, 423, 528, 530–532
- Sing around method 89
- Single particle approach 315
- Sinusoidal structures 110
- Site symmetry 49, 62, 232–233, 235, 276–277, 324, 326–327, 329, 406
 restrictions 235, 278
- Slater's transition state 321
- Slow ray **158**, 162–163, 169
- Small representations **318**, 325, 330
- Sodium 224
- Sodium chlorate (NaClO_3) 424
- Sodium chloride (NaCl) 84, 88
- Sodium lithium sulfate (NaLiSO_4) 469
- Sodium nitrate (NaNO_3) 436, 446
- Sodium nitrite (NaNO_2) 247, 389
- Sodium oxalate 450
- Sodium sulfate (Na_2SO_4) 439
- Sodium super oxide (NaO_2) 539
- Soft modes 358, 370, 378, **381–383**, 385–386, 389
- Sommerfeld model 317, 323, *see also* free-electron model
- Spatial dispersion 170–171, 342–343, 345–346
- Specific heat 3–4, 31, 88, 102, 362–363, 390
- Spectral differential cross section 334–336
- Spectral dispersion 201
- Sphalerite (ZnS) 83, 429, 446, 456
- Spherical harmonics 42, 121, 279, 322–329
- Spherical symmetry 11
- Spherical systems 17, 19, 22, 24, 26, 29–31, 82
- Spin density waves 110
- Spin flip **125**, 128
- Spin flop **125**, 133, 141
- Spin-orbit coupling 120, 145, 320, 322, 326
- Spin polarization 326
- Spin representations 61
- Spinel 83, 413, 418–419, 429, 462–463
- Spinel law 419, 423, **429**, 436, 438–439, 442, 454–455, 463–464
- Spinel twins 398, 419, 423, **429–431**, 438, 440, 442, 446, 456, 472
- Spiral structures 110
- Spontaneous ferroelectric polarization 143–144
- Spontaneous ferromagnetic moment 129
- Spontaneous magnetic order 144
- Spontaneous magnetization **108**, 111, 117, 120, 124–125, 127–128, 132, 134, 142, 144, 146
- Spontaneous magnetostriction 121, 128, **145–146**, 147–148
- Spontaneous nucleation 436, 446
- Spontaneous parametric emission 212
- Spontaneous polarization 12, 142–144, 153, **154**, 196, 367, 371, 375, 380, 382–383, 387–388, 397, 451, 455–456, 485, 487–490, 492, 494, 497, 507, 509–512, 514–515, 527, 532–536, 538–539
- Spontaneous properties 477, 487, 490–491, *see also* morphic properties
- Spontaneous shear **439**, 451–452, 465, 485, 539
- Spontaneous strain **72**, 128, 177–178, 371, 375, 378, 398, 440, 452, 485, 487, 490–493, 497, 503, 505, 510–512, 515, **516–517**, 518–519, 524, 526–528
- Spontaneous strain tensor 519
- Stabilizers 393, 399–400, **406–407**, 408, 410, 488–494, 496–497, 503, 505–507, 509, 511–512, 517, 520, 526, 532
- Stacking-fault contrast 425, 458
- Stacking faults 414, 418, 438, 443, 446, 458, 463, 469
- Standard variables 372, 379–380, 494
- Star **47**, 48–50, 122, 132, 317–318, 325–326, 367–368, 381
- Static disorder 231, 242
- Static displacements 231
- Staurolite 423, **434**, 445, 448–450, 453
- Stokes process 336–337, 347
- Strain 175, 177
 spontaneous, *see* spontaneous strain
- Strain birefringence 3, 177
- Strain ellipsoid 100
- Strain field 72, 178
- Strain-optic tensor 177–178
- Strain quadric 100
- Strain tensor 4, 13, 24, **72**, 74–75, 78, 81–85, 90, 92–93, 100, 102, 254–255, 262, 292–293, 345, 360, 369, 371, 491, 493, 516, 518
 symmetry of 24, 26, 81
- Stress quadric 79
- Stress relief 467
- Stress tensor 4, 13, 24, **76–80**, 81–82, 84, 90, 92–93, 133–134, 254, 293, 345, 349
 local properties 79
 Piola–Kirchoff 95
 special forms 78
 symmetry of 24–26, 77, 81
 Voigt notation 78
- Strontium bismuth tantalate ($\text{Sr}_x\text{Bi}_{3-x}\text{Ta}_2\text{O}_9$) 487
- Strontium titanate (SrTiO_3) 371, 383–384
- Structural twins 439
- Structure factor 232, 235, 270–273, 277, 425, 435, 458, 469, 475
- Structure-factor contrast 425
- Sublattice index 441–442, 448, 471
- Sublattice magnetization 109, 125, 127, 132, 137, 139, 141
- Sum-frequency generation (SFG) 181, 185, 191–192, **200**, 209–211
- Superconductors 288, 327, 329, 390, 440, 452, 465
- Superlattice reflections 358, 368–369, 387
- Supersaturation twins 436
- Superspace 247–251, 254
- Superspace groups 250–254, 256–257, 259
 magnetic 250–251
- Susceptibility 54, 153–155, 171, 181–182, 270–271, 338, 341–345, 510, *see also* dielectric susceptibility
 diamagnetic 107–108
 electro-optic, third-order 154
 higher-order 153, 155, 185
 nonlinear 195, 215
 optical, third-order 154
 paramagnetic 107–108
 X-ray 271, 274
- Susceptibility derivatives 334, **337**, 342, 344, 347
 first-order 346
 higher-order 342
 second-order 344
- Susceptibility tensor 54, 176, 182, 184, 270, 334
- Switching 387, 392–393, 440, 451, 485–486, 497, **505**, 508–510, 514–516, 521, 526–527
 of domains 128, 439, 440, 467, 484, 510, 512, 514
- Symmetric tensors 3, 5, 13, 24, 30, 34, 38, **42**, 51, 100, 231, 257, 290
 polar 236–238, 241
- Symmetric tensors
 rank 2 5, 17, 26, 34, 42, 51–52, 270, 360, 371, 378, 491, 505, 511
 rank 3 277
 rank 4 5, 22
- Symmetry-adapted bases 392
- Symmetry-breaking increments 371, 379–380
- Symmetry constraints 294
- Symmetry descent 370–372, 376, 378, 380, 392–394, 398, 402, 404, 407–410, 486–488, 490–496, 498, 503, 505–510, 512, 514–517, 519, 527–528, 533, 537
- equitraslational 370, 376, 381–382, 505
- Symmetry species 338, 340–345
- Symmorphic space groups 48–49, 250, 297, 302, 308, 315
- Systematic extinctions 252, 269
- T-domains, *see* twin domains
- Tail-to-tail boundaries 425, 454–455, 477
- Temperature factor, *see* Debye–Waller factor
- Temperature-stress constants 32
- Tenfold rotation 418
- Tensor atomic factors 278–280
- Tensor atomic vectors 275
- Tensor contraction 232, *see also* contraction
- Tensor derivatives 10
- Tensor expansion 232
- Tensor invariances 171
- Tensor parameter 370, 378, 380, 394, 408, 487, 489, 495
 principal 371–372, 376, 378–381, 393, 407–408, 489–490, 494, 496, 509, 514–515
 secondary 371, 375, 378, 380–381, 393, 407, 494, 509–510, 517
- Tensor product 7–10, 24, 37–38, 41–42, 51–52, 62, 68, 181, 196, 251, 255, 258
- Tensor product representation 42, 51
- Tensor product space 42–43, 52–53, 257
- Tensor representation **42**, 262, 279, 311
- Tensor structure factors 270, 278
- Tensorial covariants 371, 379–380, 392–394, 493–494, 514
- Tensorial susceptibility, symmetry restrictions 270
- Tensors
 in higher-dimensional spaces 253
 in quasiperiodic structures 246
 in superspace 254–255
 mathematical definition 7
 symmetric, *see* symmetric tensors
 transformation properties of 7, 38, 42, 51
 transformation rule 7
- Tetragonal crystals 87, 100, 110, 121, 137–138, 443, 455
- Thermal conductivity 5, 9, 13, 223, **227–229**
- Thermal diffusion 5
- Thermal displacements 231, 278
- Thermal expansion 3–4, 9, 12, 31, 72, 90, **100**, 101, 103, 105, 145, 224, 228, 286, 292–294, 383, 516
 diffraction methods 102–103
 negative 100, 104
 volume 100
- Thermal motion 231–233, 235, 387
 ellipsoid 242
- Thermal resistance 227–229
- Thermal resistivity 227–228
- Thermoelectric effect 5
- Third harmonic generation (THG) 181, 184–185, 192, 199–200, **209–210**, 215, 217
- Thomson scattering 274–275
- Threshold oscillation intensity 212–213
- Tight binding 321
- Tilings 247
- Time inversion 106, **110**, 116, 140, 143, 337, 404, 506
- Time reversal 5, 14, 35, 53–54, 120, 134, 250–252, 275–276, 278–280
- Time-reversal degeneracy 306, 309
- Time-reversal group 53
- Time-reversal operator 53–54, 56
- Tin 84
- TO–LO splitting 341, 346
- Toroidal moment 128, 140, 275
- Total cross section 335
- Tourmaline 12
- Transformation microcline 434, 453, 466

SUBJECT INDEX

- Transformation twins 398, 417–419, 422–424, 429, 431, 434–436, 438–440, 447, 452, 460–461, 464–466, 468–469
 Transition-metal carbonates 118, 129
 Transition-metal fluorides 129–130, 133, 136–139
 Transition-metal oxides 108, 118–120, 128, 326
 Transition metals 107–108, 130, 280, 325
 Transition probability 332
 Transition region 457
 Transition susceptibility 334–335, 337, 341, 345–347
 first-order 342
 Transition susceptibility tensor 335
 Transition temperature 362, 366, 369–370, 382, 384–386, 397, 440, 467, 488
 Translation boundary 414, 418, 438
 Translation domains 414, 418, 438
 Translation group 442, 447, 503, 529, 538
 Translation twins (T-twins) 418, 438
 Translational symmetry 144, 314–315, 318–319, 321, 325, 370, 381, 503
Translationengleiche subgroups, *see* equitranslational subgroups
 Transverse optic mode (TO) 336, 341, 346, 383
 Triaxial ellipsoid 157
 Trichroic crystals 169
 Tricritical point 382, 389–390
 Triglycine sulfate (TGS) 359, 380, 424–425, 454, 484–485
 Trilinear forms 7–8, 14
 Triperiodic twins 441, 442, 444, 446–447, 450
 Triple scalar product 6, 14, 73
 Tris-sarcosine calcium chloride (TSCC) 383, 387, 389
 Tropochemical cell twinning 417
 Tungsten 84, 104
 Tungsten bronzes 387
 Tweed microstructure 466
 Twin axes 417
 fourfold 448
 of order $n > 2$ 444
 n -fold 415, 422, 444
 pseudo-fivefold 419, 464
 pseudo n -fold 453
 pseudo-threefold 417
 sixfold 417
 threefold 449
 twofold 415–419, 422, 425, 429, 442, 453, 456, 469–470
 with noncrystallographic multiplicities 431
 Twin boundaries 392, 413, 415, 417–419, 423–425, 432, 435, 437, 439, 443, 446, 450, 451, 455–460, 469
 coherent 468
 compatible 452–454, 468, *see also* permissible boundaries
 incompatible 454, 468
 irrational 454, 457
 rational 452
 structural model 459
 three-dimensional structure 463
 Twin component 415, 417
 Twin displacement vector 415, 418, 441, 443, 450, 457–462, 464, 469
 Twin domains 106, 128, 177, 415, 420–421, 424–425, 428, 435–437, 439, 444, 451, 453–456, 458–459, 462, 464–470, 472, 474, 476
 Twin elements 415–417, 420
 binary 415–417
 irrational 415, 417
 rational 415, 417
 Twin formation 415
 by nucleation 436
 during crystal growth 437
 Twin inserts 437
 Twin interface 415, 417, 428, 446, 450, 455–456, 459–464, 467–469
 coherent 468–469
 Twin interface 415, 417–419, 422–424, 429, 431, 434–436, 438–440, 447, 452, 460–461, 464–466, 468–469
 Twin inversion centre 415–416, 420, 458–459
 Twin lamellae 423, 425, 437–438, 443, 454–455, 459–460, 465–468
 Twin lattice index 441–442, 444, 447
 Twin law 404, 410, 415, 417–420, 422–423, 426–431, 433, 435, 450, 452, 456, 469–474, 486, 497, 505–506, 512–513, 515, 518, 521, 527, 535
 Twin microstructure 72, 464
 Twin mirror plane 415–418, 470
 Twin obliquity 444
 Twin operations 415, 417–418, 420–423, 426, 428–429, 439, 441–442, 447–449, 452, 456, 458–459, 462, 470, 474–475
 alternative 420, 423, 426–431
 binary 415, 417, 421–422, 428, 434, 449
 Twin partner 398, 415–417, 419, 421, 424, 428, 431–432, 441–442, 447–448, 450, 456–458, 468–470, 472, 474–475, 477
 Twin pattern 464
 Twin plane 165, 168, 415–417
 Twin rotations
 fivefold 431
 noncrystallographic 422
 pseudo n -fold 417, 422
 tenfold 431
 Twin textures 464
 Twinkling 159
 Twinning 177, 358–359, 397
 by high-order merohedry 434
 by lattice merohedry 442
 by merohedry 397, 423, 425, 435, 440, 442, 446–447, 470–471, 515
 by pseudo-merohedry 397, 446–447, 470, 476
 by reticular merohedry 397, 425, 442, 448, 470–472
 by reticular pseudo-merohedry 397, 435, 447, 476
 by twin-lattice pseudo-symmetry 447
 by twin-lattice symmetry 447
 classification in reciprocal space 469
 definition 414
 lattice aspects of 440–441
 with a change of form 440
 with partial lattice coincidence (lattice index $|j| > 1$) 448
 with partial lattice pseudo-coincidence (lattice index $|j| > 1$) 448
 without a change of form 440
 Twinning dislocations 454, 467–468
 Twinning group 394, 486, 489, 497–498, 505–506, 508–509, 512–515, 519, 521, 526–527, 535
 Twinning pattern 359
 Twinning relation 413
 Twins 358, 397, 414, 486
 definition of 415
 diffraction patterns of 420, 435, 441, 469–471, 475–477
 genetic classification 436
 morphological classification 417–419, 440
 pseudo-hexagonal 476
 with inclined axes 424–425, 427–428, 445, 452, 464
 with lattice index $|j| > 1$ 454
 Twins of twins 435–436
 Two-dimensional nucleus 437
 Two-wave mixing 153–154
 Undepleted pump approximation 199, 200, 205, 208–210
 Uniaxial antiferromagnets 124–126, 138
 Uniaxial classes 163, 168, 188, 197–198, 202, 338, 341
 Uniaxial crystals 11, 119, 121, 123–124, 156, 158, 159, 168–169, 171, 173, 188–189, 192–193, 196–199, 201–204, 215
 birefringence in 138
 magnetic birefringence in 138
 magnetostriiction in 148
 negative 192–193
 positive 204
 Uniaxial ellipsoid 156
 Uniaxial ferromagnets 124–125
 Uniaxial figure 164–165, 168
 Uniaxial indicatrix 156–157, 176–177
 Uniaxial negative 164
 Uniaxial positive 164
 Uniaxial stress 78, 80, 83, 97, 440
 Unit-cell twinning 417
 Universal stage 169
 Valence electrons 280, 317, 319, 322, 325–327, 332
 Valence states 320, 323, 325, 332, 383, 463
 Variants, *see* domain states
 Variational principle 320–321, 323
 Vector product 9–10, 12, 14
 Vector representation 298, 310–311, 379
 Vector spaces 5, 7, 34–38, 42, 51–52, 55, 251, 257, 259, 302, 304, 306, 363, 365, 367, 405
 irreducible 304, 363
 Velocity of elastic waves 290
 Velocity of sound 88, 179
 Vibration direction 157–160, 162–166, 168–169
 fast 162
 slow 162, 164
 Voigt effect, *see* Cotton–Mouton effect
 Voigt matrix 24, 78, 539
 Voigt notation 24, 78–79, 81–82, 134, 175–176
 Voigt strain matrix 24–27, 75
 Voigt stress matrix 24, 78
 Volume compressibility 83, 101, 104
 Voronoi cell 46, 47, 314
 W boundary 452–454
 W' boundary 452
 Walk-off 188–190, 200, 203–206, 209–211
 temporal 205
 Walk-off angle 187, 189–190, 197, 200, 203–204, 206, 209, 214–216
 Wavevector selection rules 347
 Wigner–Seitz cell 46–47, 314
 Wurtzite 226, 277–278
 Wyckoff position 49, 62, 235, 331, 407–408
 X-ray absorption edges 269, 275
 X-ray absorption spectroscopy 270, 332
 X-ray anomalous dispersion 170
 X-ray crystallography 386–387, 392
 X-ray diffraction 270, 274, 367–368, 413–414, 441, 443–444, 447, 452, 458, 466, 469, 473, 520
 X-ray emission spectra 332
 X-ray magnetic circular dichroism 270, 278
 X-ray scattering 274, 276–277, 280, 381, 387, 391–392
 X-ray susceptibility 271, 274
 X-ray topography 423, 425, 438, 447, 454, 458, 460, 468–469, 476
 Young's modulus 3, 80–81, 83–84, 440
 variation with orientation 84
 Yttrium barium copper oxide (YBaCuO) 329–330, 390, 440, 452, 465–466, 468, 484, 519
 Yttrium manganese oxide (YMnO₃) 144–145
 Zero-point motion 231
 Zinc 84
 Zinc oxide 226, 277–278
 Zwilling, *see* twins